Access DB# 105885

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Adrews Oltmans Examiner # : 76211 Date: 10/14/03
Art Unit: 1742 Phone Number 308-2594 Serial Number: 10/042549
Mail Box and Bldg/Room Location: CP3-7C07 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: ______

Inventors (please provide full names): ______

Earliest Priority Filing Date: ______

****For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.***

INDEX SEARCH! US20020157736.
NTIS?
EI
- INSPEC, COMPEDEX, SciSearch, JICST, JAPIO, DERWENT

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STAFF USE ONLY	Type of Search	Vendors and cost where applicable
Searcher: JC	NA Sequence (#)	STN $ 227.99
Searcher Phone #:	AA Sequence (#)	Dialog $ 5.31 index search
Searcher Location:	Structure (#)	Questel/Orbit
Date Searcher Picked Up: 9/14/03	Bibliographic ✓	Dr.Link
Date Completed: 9/14/03	Litigation	Lexis/Nexis
Searcher Prep & Review Time: 120	Fulltext	Sequence Systems
Clerical Prep Time:	Patent Family	WWW/Internet
Online Time: 120	Other	Other (specify)

PTO-1590 (8-01)

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     (FILE 'HOME' ENTERED AT 16:45:48 ON 14 OCT 2003)

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L1            1 S E3
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     FILE 'REGISTRY' ENTERED AT 16:46:30 ON 14 OCT 2003
L2            2 S E1-E2
L3            1 S L2 AND NIOBIUM
L4            1 S L2 AND TANTALUM

     FILE 'HCA' ENTERED AT 16:47:01 ON 14 OCT 2003
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L7       119898 S L5 OR TANTALUM# OR TA
L8       176221 S L6 OR NIOBIUM# OR NB
L9       395446 S EXTRUD? OR EXTRUS? OR DETRUD? OR DISCHARG? OR EXPEL?
L10      126724 S EXTRUD? OR EXTRUS?
L11      539889 S PURIT? OR PURE?
L12      353203 S GRAIN?
L13      111005 S SPUTTER?
L14      325324 S TARGET?
L15        9507 S L13(2N)L14
L16         880 S L7 AND L15
L17           6 S L16 AND L10
L18           3 S L17 AND L12
L19           2 S L17 AND L11
L20           6 S L17 OR L18 OR L19
L21           5 S L20 AND 1907-2000/PY,PRY
L22           6 S L20 OR L21
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L25        393246 S ?PURIT?
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L27             6 S L26 AND (L24 OR L25)
L28             6 S L1 OR L17
L29            10 S L22 OR L27

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L36           335 S L30 AND L32
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L38             0 S L37 AND L11
L39        719808 S L23 OR L25
L40         10762 S BILLET?
L41            22 S L31 AND L40
L42             0 S L41 AND L13
L43             3 S L41 AND L11
L44             4 S L34 OR L43
L45            19 S L41 NOT L44

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L47             6 S L16 AND L46
L48            15 S L29 OR L47

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L51             0 FILE SCISEARCH
L52             1 FILE NTIS
L53             0 FILE JICST-EPLUS
     TOTAL FOR ALL FILES
L54             3 S L44 AND TANTALUM#
L55             1 FILE INSPEC
L56             0 FILE COMPENDEX
L57             0 FILE SCISEARCH
L58            11 FILE NTIS
L59             2 FILE JICST-EPLUS
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L60            14 S L45 AND TANTALUM#

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L63         59128 S L10
L64         34791 S L13
L65         85976 S L14
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L74           2 S L73 AND L72
L75           3 S L69 OR L74
L76          23 S L73 NOT L75

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L84        5858 S L82(2N)L83
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L86           5 S L85 AND L79
L87           8 S L85 AND L78
L88          48 S L85 AND L80
L89          12 S L88 AND L81
L90          12 S L89 AND L82
L91          17 S L86 OR L87 OR L89 OR L90
L92          13 S L91 AND (SPUTTER? AND (TARGET? OR AGENT?))/TI
L93           4 S L91 NOT L92

     FILE 'HCA' ENTERED AT 17:13:23 ON 14 OCT 2003
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=> d L48 1-15 cbib abs hitind hitrn

L48 ANSWER 1 OF 15 HCA COPYRIGHT 2003 ACS on STN
138:213908 Fine **grain** size material, **sputtering target**, methods of forming, and micro-arc reduction method. Segal, Vladimir; Thomas, Michael E.; Li, Jianxing; Ferrasse, Stephane; Alford, Frank; Scott, Tim; Turner, Stephen (USA). U.S. Pat. Appl. Publ. US 2003052000 A1 20030320, 22 pp., Cont.-in-part of U. S. Ser. No. 586,326, abandoned. (English). CODEN: USXXCO. APPLICATION: US 2002-225272 20020820. PRIORITY: US 1997-PV52218 19970711; US 1998-98761 19980617; US 2000-586326 20000602.

AB The invention pertains to fine **grain** materials and **sputtering targets** as well as methods of forming them and micro-arc redn. methods. A material may include **grains** of sizes such that .gtoreq.99% of a measured area contains **grains** that exhibit **grain** areas <10 times an area of a mean **grain** size of the measured area. As examples, .gtoreq.99% of the measured area may contain **grains** with **grain** areas <8, 6, or 3 times the area of the mean **grain** size. The **grains** may also have a mean **grain** size of <3 times a min. statically recrystd. **grain** size, e.g., a mean **grain** size of .ltorsim.50 .mu.m, 10 .mu.m, or 1 .mu.m. The material may be comprised by a **sputtering target** and a thin film may be deposited on a substrate from such a **sputtering target**. A micro-arc redn. method may include sputtering a film from a **sputtering target** comprising **grains**

of sizes as described. A **sputtering target** forming
method may include deforming a sputtering material. After the deforming,
the sputtering material may be shaped into at least a portion of a
sputtering target. The **sputtering**
target may include **grains** of sizes as described. Also,
the deforming may induce a strain level corresponding to .epsilon. of at
least .apprx.4. Further, the deforming may include equal channel angular
extrusion.

IC ICM C23C014-34
NCL 204298130; 420591000; 428544000
CC 76-11 (Electric Phenomena)
ST micro arc redn **sputtering target** fine **grain**
material
IT Sputtering
Sputtering targets
(fine **grain** size material, **sputtering**
target, methods of forming, and micro-arc redn. method)
IT 7429-90-5, Aluminum, uses 7429-91-6, Dysprosium, uses 7439-88-5,
Iridium, uses 7439-89-6, Iron, uses 7439-91-0, Lanthanum, uses
7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7439-98-7,
Molybdenum, uses 7440-00-8, Neodymium, uses 7440-02-0, Nickel, uses
7440-03-1, Niobium, uses 7440-05-3, Palladium, uses 7440-06-4,
Platinum, uses 7440-18-8, Ruthenium, uses 7440-19-9, Samarium, uses
7440-20-2, Scandium, uses 7440-21-3, Silicon, uses 7440-22-4, Silver,
uses 7440-24-6, Strontium, uses **7440-25-7, Tantalum**,
uses 7440-27-9, Terbium, uses 7440-31-5, Tin, uses 7440-32-6,
Titanium, uses 7440-33-7, Tungsten, uses 7440-36-0, Antimony, uses
7440-39-3, Barium, uses 7440-41-7, Beryllium, uses 7440-42-8, Boron,
uses 7440-44-0, Carbon, uses 7440-45-1, Cerium, uses 7440-47-3,
Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses
7440-53-1, Europium, uses 7440-54-2, Gadolinium, uses 7440-55-3,
Gallium, uses 7440-56-4, Germanium, uses 7440-57-5, Gold, uses
7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-65-5, Yttrium,
uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 7440-69-9,
Bismuth, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses
7782-49-2, Selenium, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**sputtering target** contg.; fine **grain**
size material, **sputtering target**, methods of
forming, and micro-arc redn. method)
IT **7440-25-7, Tantalum**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**sputtering target** contg.; fine **grain**
size material, **sputtering target**, methods of
forming, and micro-arc redn. method)

L48 ANSWER 2 OF 15 HCA COPYRIGHT 2003 ACS on STN
137:314429 Manufacture of **extruded** extra-**pure**
tantalum and niobium **billets** for **sputtering**
target. Michaluk, Christopher A. (USA). U.S. Pat. Appl. Publ. US
2002157736 A1 20021031, 19 pp. (English). CODEN: USXXCO. APPLICATION:
US 2002-42549 20020109. PRIORITY: US 2001-PV261001 20010111.
AB **Extruded tantalum billets** and niobium
billets are described having a **purity** of at least about
99.995% and a substantially uniform **grain** size, preferably an
av. **grain** size of .ltoreq.150 .mu.m, and more preferably an av.
grain size of 25-100 .mu.m. The **extruded**
billets can then be forged or processed by other conventional
techniques to form end use products such as **sputtering**
targets. A process for making the **Ta** or Nb

billets includes (a) triple electron beam melting to obtain 3.75 in. **billet**, (b) **extruding** a starting **billet** at a sufficient temp. in the range of 1200-2950 F, (c) at least partially recrystg. the **billet** by annealing for 2 h at 950-1150.degree. followed by water quenching, and (d) cleaning and machining the **extruded billet**.

IC ICM C22C027-02
ICS C22F001-18

NCL 148422000

CC 56-11 (Nonferrous Metals and Alloys)

ST **tantalum** niobium **extrusion sputtering target**

IT Melting
(electron-beam-induced, extra-**pure Ta** and Nb; manuf. of **extruded** extra-**pure tantalum** and niobium **billets** for **sputtering target**)

IT **Extrusion**, nonbiological
Grain size
(extra-**pure Ta** and Nb **billets**; manuf. of **extruded** extra-**pure tantalum** and niobium **billets** for **sputtering target**)

IT **Sputtering targets**
(extra-**pure Ta** and Nb; manuf. of **extruded** extra-**pure tantalum** and niobium **billets** for **sputtering target**)

IT Recrystallization
(**extruded Ta** and Nb **billets**; manuf. of **extruded** extra-**pure tantalum** and niobium **billets** for **sputtering target**)

IT 7440-03-1, Niobium, processes **7440-25-7, Tantalum**, processes
RL: EPR (Engineering process); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(extra-**pure Ta** and Nb **billets**; manuf. of **extruded** extra-**pure tantalum** and niobium **billets** for **sputtering target**)

IT **7440-25-7, Tantalum**, processes
RL: EPR (Engineering process); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(extra-**pure Ta** and Nb **billets**; manuf. of **extruded** extra-**pure tantalum** and niobium **billets** for **sputtering target**)

L48 ANSWER 3 OF 15 HCA COPYRIGHT 2003 ACS on STN

137:173282 Forged refractory metal plates with uniform texture suitable for manufacture of **sputtering targets**. Jepson, Peter R.; Uhlenhut, Henning; Kumar, Prabhat (H.C. Starck, Inc., USA). U.S. Pat. Appl. Publ. US 2002112789 A1 20020822, 12 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-79286 20020220. PRIORITY: US 2001-PV269983 20010220.

AB The high-purity **Ta** or Nb **billets** for manuf. of **sputtering targets** are processed by cutting the **billet** to short length, and pressing or forging along alternating orthogonal axes with intermediate annealing and recrystn. to manuf. the plates having fine-grained microstructure and uniform texture. The **sputtering targets** are manufd. by machining the plates .gtoreq.0.8 in. thick to the final shape. The uniform texture promotes the sputtering deposition with a predictable rate and controlled film

thickness.
IC ICM C22C027-02
ICS C23C014-34; C21C001-00
NCL 148422000
CC 56-11 (Nonferrous Metals and Alloys)
ST **tantalum billet** forging plate **sputtering target** manuf; niobium **billet** forging plate **sputtering target** manuf
IT **Sputtering targets**
(forged refractory metal plates with uniform texture for **sputtering targets**)
IT Recrystallization
(of **sputtering targets**; forged refractory metal plates with uniform texture for **sputtering targets**)
IT 7440-03-1, Niobium, uses **7440-25-7, Tantalum,** uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**sputtering targets**; forged refractory metal plates with uniform texture for **sputtering targets**)
IT **7440-25-7, Tantalum,** uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**sputtering targets**; forged refractory metal plates with uniform texture for **sputtering targets**)

L48 ANSWER 4 OF 15 HCA COPYRIGHT 2003 ACS on STN
135:265831 Methods of forming aluminum-comprising physical vapor deposition **targets, sputtered** films, and **target** constructions. Segal, Vladimir M.; Li, Jianxing; Alford, Frank; Ferrasse, Stephane (Honeywell International Inc., USA). PCT Int. Appl. WO 2001073156 A2 20011004, 32 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-US9813 20010327. PRIORITY: US 2000-PV193354 20000328; US 2001-783377 20010213.
AB The invention includes a method of forming an Al-comprising phys. vapor deposition target. An Al-comprising mass is deformed by equal channel angular **extrusion**. The mass is at least 99.99 Al and further comprises less than or equal to .apprx.1,000 ppm of one or more dopant materials comprising elements selected from the group consisting of Ac, Ag, As, B, Ba, Be, Bi, C, Ca, Cd, Ce, Co, Cr, Cu, Dy, Er, Eu, Fe, Ga, Gd, Ge, Hf, Ho, In, Ir, La, Lu, Mg, Mn, Mo, N, Nb, Nd, Ni, O, Os, P, Pb, Pd, Pm, Po, Pr, Pt, Pu, Ra, Rf, Rh, Ru, S, Sb, Sc, Se, Si, Sm, Sn, Sr, **Ta**, Tb, Te, Ti, Tl, Tm, V, W, Y, Yb, Zn and Zr. After the Al-comprising mass is deformed, the mass is shaped into at least a portion of a **sputtering target**. The invention also encompasses a phys. vapor deposition target consisting essentially of Al and less than or equal to 1,000 ppm of one or more dopant materials comprising elements selected from the group consisting of Ac, Ag, As, B, Ba, Be, Bi, C, Ca, Cd, Ce, Co, Cr, Cu, Dy, Er, Eu, Fe, Ga, Gd, Ge, Hf, Ho, In, Ir, La, Lu, Mg, Mn, Mo, N, Nb, Nd, Ni, O, Os, P, Pb, Pd, Pm, Po, Pr, Pt, Pu, Ra, Rf, Rh, Ru, S, Sb, Sc, Se, Si, Sm, Sn, Sm, Sr, **Ta**, Tb, Te, Ti, Tl, Tm, V, W, Y, Yb, Zn and Zr. Addnl., the invention encompasses thin films.
IC ICM C23C014-34
ICS C23C014-14; C22C021-00
CC 76-12 (Electric Phenomena)

Section cross-reference(s): 56
ST **sputtering target** aluminum dopant deformation
IT Deformation (mechanical)
Dopants
Sputtering
Sputtering targets
(methods of forming aluminum-comprising phys. vapor deposition **targets**, **sputtered** films, and **target** constructions)
IT Films
(sputter-deposited; methods of forming aluminum-comprising phys. vapor deposition **targets**, **sputtered** films, and **target** constructions)
IT 7429-91-6, Dysprosium, uses 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-91-0, Lanthanum, uses 7439-92-1, Lead, uses 7439-94-3, Lutetium, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-00-8, Neodymium, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-07-5, Plutonium, uses 7440-08-6, Polonium, uses 7440-10-0, Praseodymium, uses 7440-12-2, Promethium, uses 7440-14-4, Radium, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-19-9, Samarium, uses 7440-20-2, Scandium, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-24-6, Strontium, uses **7440-25-7, Tantalum**, uses 7440-27-9, Terbium, uses 7440-28-0, Thallium, uses 7440-30-4, Thulium, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-34-8, Actinium, uses 7440-36-0, Antimony, uses 7440-38-2, Arsenic, uses 7440-39-3, Barium, uses 7440-41-7, Beryllium, uses 7440-42-8, Boron, uses 7440-43-9, Cadmium, uses 7440-44-0, Carbon, uses 7440-45-1, Cerium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-52-0, Erbium, uses 7440-53-1, Europium, uses 7440-54-2, Gadolinium, uses 7440-55-3, Gallium, uses 7440-56-4, Germanium, uses 7440-58-6, Hafnium, uses 7440-60-0, Holmium, uses 7440-62-2, Vanadium, uses 7440-64-4, Ytterbium, uses 7440-65-5, Yttrium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 7440-69-9, Bismuth, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses 7704-34-9, Sulfur, uses 7723-14-0, Phosphorus, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses 7782-49-2, Selenium, uses 13494-80-9, Tellurium, uses 53850-36-5, Rutherfordium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(methods of forming aluminum-comprising phys. vapor deposition **targets**, **sputtered** films, and **target** constructions)
IT 7429-90-5, Aluminum, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(methods of forming aluminum-comprising phys. vapor deposition **targets**, **sputtered** films, and **target** constructions)
IT **7440-25-7, Tantalum**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(methods of forming aluminum-comprising phys. vapor deposition **targets**, **sputtered** films, and **target** constructions)

L48 ANSWER 5 OF 15 HCA COPYRIGHT 2003 ACS on STN
135:39802 High-strength **sputtering targets** of high-**purity** metals and alloys and method of making using casting and homogenization. Segal, Vladimir; Ferrasse, Stephane; Willett, William B.

(Honeywell Inc., USA). PCT Int. Appl. WO 2001044536 A2 20010621, 38 pp.
DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US33997 20001215. PRIORITY: US 1999-465492 19991216.

AB Described is a high quality **sputtering target** and method of manuf. which involves application of equal channel angular **extrusion** as well as casting and homogenization.

IC ICM C23C014-34

CC 76-12 (Electric Phenomena)
Section cross-reference(s): 56

ST **sputtering target** metal casting **extrusion** homogenization forging

IT Annealing
Casting of metals
Extrusion of metals
Forging
Homogenization
Quenching (cooling)
Sputtering targets
Texture (metallographic)
(high-strength **sputtering targets** of high-**purity** metals and alloys and method of making using casting and homogenization)

IT Alloys, processes
Metals, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(high-strength **sputtering targets** of high-**purity** metals and alloys and method of making using casting and homogenization)

IT Process control
(texturing; high-strength **sputtering targets** of high-**purity** metals and alloys and method of making using casting and homogenization)

IT 7429-90-5, Aluminum, processes 7439-98-7, Molybdenum, processes 7440-02-0, Nickel, processes 7440-06-4, Platinum, processes 7440-22-4, Silver, processes **7440-25-7, Tantalum**, processes 7440-32-6, Titanium, processes 7440-50-8, Copper, processes 7440-57-5, Gold, processes 11100-89-3
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(high-strength **sputtering targets** of high-**purity** metals and alloys and method of making using casting and homogenization)

IT **7440-25-7, Tantalum**, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(high-strength **sputtering targets** of high-**purity** metals and alloys and method of making using casting and homogenization)

L48 ANSWER 6 OF 15 HCA COPYRIGHT 2003 ACS on STN
134:356299 Manufacture of metal articles with fine uniform structure and texture for **sputtering targets**. Segal, Vladimir

(USA). U.S. Pat. Appl. Publ. US 20010001401 A1 20010524, 10 pp.
(English). CODEN: USXXCO. APPLICATION: US 1998-098761 19980617.

AB The process includes (a) forging of the **billet** below the temp. of static recrystn. with 70-90% redn. and (b) cold rolling with controlled processing parameters. A lubricant comprising polyethylene, polyurethane, or polytetrafluoroethylene is used during forging. The metal article produced has a min. of statically recrystd. grain size difference of .ltoreq..+-.3%, as well as a dispersion in orientation content ratio of textures of <.+-.4% at any location.

IC ICM C22F001-18

NCL 148670000

CC 56-11 (Nonferrous Metals and Alloys)

ST **sputtering target tantalum** forging rolling
texture grain size

IT Fluoropolymers, processes
Polyurethanes, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(forging lubricant; manuf. of metal articles with fine uniform structure and texture for **sputtering targets**)

IT Cold rolling
Forging
Grain size
Recrystallization
Sputtering targets
Texture (metallographic)
(manuf. of metal articles with fine uniform structure and texture for **sputtering targets**)

IT 9002-84-0, Polytetrafluoroethylene 9002-88-4, Polyethylene
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(forging lubricant; manuf. of metal articles with fine uniform structure and texture for **sputtering targets**)

IT **7440-25-7, Tantalum**, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(manuf. of metal articles with fine uniform structure and texture for **sputtering targets**)

IT **7440-25-7, Tantalum**, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(manuf. of metal articles with fine uniform structure and texture for **sputtering targets**)

L48 ANSWER 7 OF 15 HCA COPYRIGHT 2003 ACS on STN

134:166720 Hot-rolled **Ta** strip for fabrication of fine-grained **targets** for cathodic **sputtering** in electronic applications. Zhang, Hao (Tosoh SMD, Inc., USA). U.S. US 6193821 B1 20010227, 8 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-353700 19990714. PRIORITY: US 1998-PV97153 19980819.

AB High-purity **Ta billet** is forged to manuf. a strip with side rolling for transverse redn. of 70-85% from the centerline (preferably at 25-400.degree.), followed by: (a) annealing in vacuum at 900-1200.degree.; (b) upset forging the strip at preferably 25-400.degree. and 90-99% redn. to a plate having square-section shape; (c) vacuum annealing at 900-1200.degree.; and (d) machining the annealed plate to manuf. a round **sputtering target**. The resulting target has fine grain size of 20-25 .mu.m, and crystallog., texture suitable for increased sputtering in deposition of uniform **Ta** films on elec. integrated circuits.

IC ICM C22F001-18

NCL 148668000

CC 56-11 (Nonferrous Metals and Alloys)
Section cross-reference(s): 76
ST **sputtering tantalum target** manuf ingot
forging; elec circuit **tantalum sputtering**
target manuf
IT Integrated circuits
(**Ta** films on; **Ta**-ingot strip as fine-grained target
for cathodic film sputtering on electronic app.)
IT **Sputtering targets**
(**Ta**-ingot strip as fine-grained target for cathodic film
sputtering on electronic app.)
IT Cast alloys
RL: TEM (Technical or engineered material use); USES (Uses)
(**Ta**; **Ta**-ingot strip as fine-grained target for
cathodic film sputtering on electronic app.)
IT Forging
(of **Ta**; **Ta**-ingot strip as fine-grained target for
cathodic film sputtering on electronic app.)
IT **7440-25-7, Tantalum,** uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**sputtering target;** **Ta**-ingot strip as
fine-grained target for cathodic film sputtering on electronic app.)
IT **7440-25-7, Tantalum,** uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**sputtering target;** **Ta**-ingot strip as
fine-grained target for cathodic film sputtering on electronic app.)

L48 ANSWER 8 OF 15 HCA COPYRIGHT 2003 ACS on STN
134:80020 Fabrication of magnetic disks, fabricated magnetic disks, and
magnetic disk array system.. Takagaki, Atsusada; Matsuda, Yoshifumi
(Hitachi, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001006164 A2 20010112,
4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-169317 19990616.
AB In manuf. of magnetic disks using plural vacuum chambers having changeable
chamber atm., where a heating chamber for heating disk-like nonmagnetic
substrates, an undercoating formation chamber, a magnetic layer formation
chamber, and a protecting layer formation chamber are arranged in order
for forming multilayer films on the substrates, while heating the
substrates, inert gas (e.g., Ar) is introduced into the heating chamber
for uniformly heating the substrates and promoting **discharge** of
impurity gases by gas flow. The above stated substrates can be
Ni-P alloy-plated mirror-polished Al-Mg alloy substrates; the undercoating
can be Cr undercoating; and the magnetic layer can be Co-Cr-**Ta**
alloy layer. The magnetic disks are heated in vacuum by IR lamps.
Manufd. magnetic disks and magnetic disk array system are described.
IC ICM G11B005-84
CC 77-8 (Magnetic Phenomena)
Section cross-reference(s): 73
IT **Impurities**
(gaseous, promoting **discharge** of; fabrication of magnetic
disks and fabricated magnetic disks and magnetic disk array system)
IT 292059-14-4
RL: DEV (Device component use); PEP (Physical, engineering or chemical
process); PROC (Process); USES (Uses)
(**sputtering target;** fabrication of magnetic disks
and fabricated magnetic disks and magnetic disk array system)

L48 ANSWER 9 OF 15 HCA COPYRIGHT 2003 ACS on STN
132:39094 High-purity **tantalum** strip manufactured with uniform
microstructure and texture for **sputtering targets**.
Shah, Ritesh P.; Segal, Vladimir (Johnson Matthey Electronics, Inc., USA).

PCT Int. Appl. WO 9966100 A1 19991223, 15 pp. DESIGNATED STATES: W: CN, DE, GB, JP, KR, SE, SG; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1998-US18676 19980908. PRIORITY: US 1998-98760 19980617.

AB The **Ta billet** of .gtoreq.99.95% purity is processed by frictionless forging to manuf. a **sputtering target** having fine-grained uniform microstructure and cubic crystallog. texture. The **Ta billet** is preferably forged by cold upsetting in a press lined with polymer-film lubricant, processed by rolling in different directions, and then is finished by recrystn. annealing.

IC ICM C23C014-34
ICS C22C027-02; B21C001-00; B32B015-01

CC 56-11 (Nonferrous Metals and Alloys)
Section cross-reference(s): 51

ST **tantalum sputtering target** manuf **billet** forging; polymer film lubricant **tantalum** **billet** forging

IT Recrystallization
(annealing; **tantalum** strip with uniform microstructure and texture annealed for **sputtering targets**)

IT Forging
(frictionless; **tantalum** strip with uniform microstructure and texture forged for **sputtering targets**)

IT Lubricants
(polymer film; **tantalum billet** forged with polymer film lubricant for uniform microstructure and texture in annealed **sputtering targets**)

IT **Sputtering targets**
(**tantalum** strip with uniform microstructure and texture for **sputtering targets**)

IT **7440-25-7, Tantalum**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**sputtering targets; tantalum** strip with uniform microstructure and texture for **sputtering targets**)

IT **7440-25-7, Tantalum**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**sputtering targets; tantalum** strip with uniform microstructure and texture for **sputtering targets**)

L48 ANSWER 10 OF 15 HCA COPYRIGHT 2003 ACS on STN

130:99188 **Billet** forging, cold rolling, and recrystallization annealing to manufacture metal plate having uniform texture. Segal, Vladimir (Johnson Matthey Electronics, Inc., USA). PCT Int. Appl. WO 9902743 A1 19990121, 20 pp. DESIGNATED STATES: W: CN, DE, GB, JP, KR, SE, SG; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1998-US13447 19980626. PRIORITY: US 1997-52218 19970711.

AB The fine-grained metal plate suitable for a **sputtering target** is manufd. by: (a) hot forging of the metal **billet** below recrystn. temp., using lubricated **billet** ends for uniform deformation with 70-90% redn.; (b) cold rolling the cooled plate with the nominal redn. of 10-20%/pass for uniform strain distribution; and (c) heating the plate for recrystn. annealing to form the fine-grained microstructure having uniform texture. High-purity Ti ingot was swaged to the rod of 130 mm diam., and cut to form the **billet** 162 mm long, and the **billet** was deformed by: (a) upsetting at 350.degree. to the final thickness of 54 mm, using fluoropolymer lubricant as the end coating; and (b) cold rolling at 12%/pass in 8 passes with change of

direction, followed by 2-h annealing near 375.degree. for recrystn. to the grain size of .apprx.6 .mu.m, vs. .apprx.60 .mu.m after 2-h annealing at 675.degree..
IC ICM C21D008-00
ICS C22C005-02; C22C005-04; C22C005-06; C22C009-00; C22C014-00; C22C019-00; C22C021-00; C22C027-00
CC 56-11 (Nonferrous Metals and Alloys)
ST **billet** forging plate recrystn **sputtering target**; titanium forging plate recrystn **sputtering target**
IT Lubrication
(forging with; manuf. of uniformly textured plates from hot-forged metal **billet** by cold rolling and recrystn. annealing)
IT Fluoropolymers, processes
Polyurethanes, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(lubrication with, in forging; uniformly textured metal plates manufd. from hot-forged **billet** by cold rolling and recrystn. annealing)
IT **Sputtering targets**
(metal plates; manuf. of uniformly textured **sputtering targets** from forged metal **billet** by cold rolling and recrystn. annealing)
IT Recrystallization
(of metal plates; manuf. of uniformly textured plates from hot-forged metal **billet** by cold rolling and recrystn. annealing)
IT 9002-84-0, Polytetrafluoroethylene 9002-88-4, Polyethylene
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(lubrication with, in forging; uniformly textured metal plates manufd. from hot-forged **billet** by cold rolling and recrystn. annealing)
IT **7440-25-7, Tantalum**, uses 7440-32-6, Titanium, uses
RL: DEV (Device component use); USES (Uses)
(**sputtering, targets** for; uniformly textured metal plate targets manufd. from hot-forged **billet** by cold rolling and recrystn. annealing)
IT **7440-25-7, Tantalum**, uses
RL: DEV (Device component use); USES (Uses)
(**sputtering, targets** for; uniformly textured metal plate targets manufd. from hot-forged **billet** by cold rolling and recrystn. annealing)

L48 ANSWER 11 OF 15 HCA COPYRIGHT 2003 ACS on STN
128:207985 Magnetron-sputtered superhard materials. Ulrich, S.; Theel, T.; Schwan, J.; Ehrhardt, H. (Erwin-Schrodinger-Strasse, FB Physik, Universitat Kaiserslautern, 67663, Kaiserslautern, Germany). Surface and Coatings Technology, 97(1-3), 45-59 (English) 1997. CODEN: SCTEEJ. ISSN: 0257-8972. Publisher: Elsevier Science S.A..
AB Superhard materials such as nanocryst. cubic boron nitride (c-BN) and .beta.-silicon carbide (.beta.-SiC) as well as amorphous boron carbide (B4C) and highly tetrahedral amorphous carbon (**ta**-C) are produced by radio frequency (RF) unbalanced magnetron sputtering in combination with intense ion plating in a **pure** argon **discharge**. As a result of energy and mass anal. the film-forming fluxes .PHI.n consist of **sputtered** at. **target** components and the plating flux .PHI.Ar+ of argon ions. Subplantation, ion-plating-induced increase of surface mobility and substrate-temp.-induced crystn. are the three main parameters affecting the formation of superhard phases with strong covalent bonding. Knock-on subplantation allows the formation of B4C with hardness up to 72 GPa at a flux ratio

.PHI.Ar+/.PHI.n of 3 for a plating energy of 75 eV. Also c-BN and **ta**-C can be produced with similar parameters. In the case of SiC, densification is diminished by preferential sputtering of Si and consequently stoichiometry and hardness are adversely affected. However, intense ion plating with a low ion energy of 25 eV and small film-forming fluxes shift the temp. of the phase transition from amorphous to nanocryst. .beta.-SiC from the usual value of >900 .degree.C to about 420 .degree.C. Furthermore, investigations of the formation of superhard materials in the ternary system boron-carbon-nitrogen are reported.

CC 57-7 (Ceramics)

IT Vapor deposition process
(ion plating; superhard material deposition mechanism in radio-frequency unbalanced magnetron-sputter prepn. in combination with intense ion plating in a **pure** argon **discharge**)

IT Sputtering
(radio-frequency, unbalanced magnetron; superhard material deposition mechanism in radio-frequency unbalanced magnetron-sputter prepn. in combination with intense ion plating in a **pure** argon **discharge**)

IT Materials
(superhard materials; superhard material deposition mechanism in radio-frequency unbalanced magnetron-sputter prepn. in combination with intense ion plating in a **pure** argon **discharge**)

IT 409-21-2P, Silicon carbide (SiC), preparation 12069-32-8P, Boron carbide (B4C)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(coatings, superhard; superhard material deposition mechanism in radio-frequency unbalanced magnetron-sputter prepn. in combination with intense ion plating in a **pure** argon **discharge**)

IT 10043-11-5P, Boron nitride (BN), preparation
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(cubic, superhard coatings; superhard material deposition mechanism in radio-frequency unbalanced magnetron-sputter prepn. in combination with intense ion plating in a **pure** argon **discharge**)

IT 7440-44-0P, Carbon, preparation
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(tetrahedral amorphous, superhard coatings; superhard material deposition mechanism in radio-frequency unbalanced magnetron-sputter prepn. in combination with intense ion plating in a **pure** argon **discharge**)

L48 ANSWER 12 OF 15 HCA COPYRIGHT 2003 ACS on STN

127:286333 Al/TixW1-x metal/diffusion-barrier bilayers: interfacial reaction pathways and kinetics during annealing. Bergstrom, D. B.; Petrov, I.; Greene, J. E. (Department of Materials Science, Materials Research Laboratory, Coordinated Science Laboratory, University of Illinois, Urbana, IL, 61801, USA). Journal of Applied Physics, 82(5), 2312-2322 (English) 1997. CODEN: JAPIAU. ISSN: 0021-8979. Publisher: American Institute of Physics.

AB Polycryst. bcc. TixW1-x layers with mixed 011 and 002 texture were grown on oxidized Si(001) substrates at 600.degree. by ultrahigh-vacuum (UHV) magnetron sputter deposition from W and Ti0.33W0.67 targets using both **pure** Ar and Xe **discharges**. Ti concns. in the 100-nm-thick layers were 0, 6, and 33 at.% depending on **target**

compn. and **sputtering** gas. Al overlayers, 190-nm-thick with strong 111 preferred orientation, were then deposited in Ar at 100.degree. with and without breaking vacuum. Changes in bilayer sheet resistance Rs were monitored as a function of time **ta** and temp. **Ta** during subsequent UHV annealing. Thermal ramping of Al/W and Al/Ti0.06W0.94 bilayers at 3.degree. min-1 resulted in large (>fourfold) increases in Rs at **Ta** .simeq. 550.degree., whereas Rs in the Al/Ti0.33W0.67 bilayers did not exhibit a similar increase until .simeq.610.degree.. Area-averaged and local interfacial reactions and microstructural changes were also followed as a function of annealing conditions. The combined results indicate that Al/W and Al/Ti0.06W0.94 bilayer reactions proceed along a very similar pathway in which monoclinic WAl4 forms first as a discontinuous interfacial phase followed by the nucleation of bcc. WAl12 whose growth is limited by the rate of W diffusion, with an activation energy of 2.7 eV, into Al.. In contrast, the W diffusion rate during the early stages of Al/Ti0.33W0.67 annealing is significantly higher allowing the formation of a continuous WAl4 interfacial blocking layer which increases the overall activation energy Ea, still limited by W diffusion, to 3.4 eV and strongly inhibits further reaction. The authors attribute obsd. increases in WAl4 nucleation and growth rates in interfacial Al/Ti0.33W0.67 to a "vacancy wind" effect assocd. with the very rapid (Ea = 1.7 eV) diffusion of Ti into Al.

CC 76-2 (Electric Phenomena)

L48 ANSWER 13 OF 15 HCA COPYRIGHT 2003 ACS on STN

125:148784 Manufacture of metal **sputtering targets** having ultra-fine oriented **grains** by deposition of atomized melt optionally followed by **extrusion**. Dunlop, John Alden; Yuan, Jun; Kardokus, Janine Kiyabu; Emigh, Roger Alan (Johnson Matthey Electronics, Inc., USA). PCT Int. Appl. WO 9620055 A1 **19960704**, 26 pp. DESIGNATED STATES: W: JP, KR, SG; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1995-US16794 19951222. PRIORITY: US 1994-363397 19941223.

AB The **sputtering targets** are manufd. from atomized metal or alloy as a sintered deposit having an ultra-fine **grain** size and a dispersed small 2nd phase to promote uniform film deposition. The process is suitable for manuf. of Al or Al-alloy targets having the **grain** size <20 .mu.m. The suitable Al alloys contain .ltoreq.10% of Cu, Si, Zr, Ti, W, **Ta**, Re, Sc, Co, Mo, Hf, and/or other metals. The sintered alloy deposit is optionally **extruded** through a die with a directional change and a uniform cross-section to promote **grain** orientation and refining, and the **sputtering target** is fabricated from the **extruded** alloy. The sintered Al-0.5% Cu alloy plate was **extruded** through an equal-section die having 90.degree.-angle change and then was heat treated for 3 h at .ltoreq.400.degree., resulting in the ultrafine **grain** size of .apprx.1 .mu.m and improved crystallog. texture, vs. .apprx.100 .mu.m after conventional deformation and the same heat treatment.

IC ICM B22F003-00
ICS B22F007-04

CC 56-6 (Nonferrous Metals and Alloys)

ST **sputtering target** manuf atomized alloy sintering; aluminum alloy **sputtering** sintered **target** **extrusion**

IT Sintering
(atomizing and; sintered **sputtering targets** having ultra-fine **grain** size from atomized powder)

IT **Extrusion**
(sintered alloy; **sputtering targets**

extruded from sintered aluminum alloys having fine-**grained** microstructure)

IT **Sputtering**
(**targets**, sintered **sputtering targets** having ultra-fine **grain** size from atomized powder)

IT 7439-98-7, Molybdenum, uses 7440-03-1, Niobium, uses 7440-06-4, Platinum, uses 7440-15-5, Rhenium, uses 7440-20-2, Scandium, uses 7440-21-3, Silicon, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses 7440-58-6, Hafnium, uses 7440-67-7, Zirconium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(aluminum alloys contg.; **sputtering** alloy **targets** sintered from atomized powder for fine-**grained** structure)

IT 7429-90-5, Aluminum, processes 11100-89-3
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**sputtering**; sintered **sputtering targets** having ultra-fine **grain** size from atomized powder)

L48 ANSWER 14 OF 15 HCA COPYRIGHT 2003 ACS on STN
123:270890 Aluminum alloy **sputtering target** and magnetooptical recording material. Kawaguchi, Yukio; Matsubuchi, Sachiko (Tdk Electronics Co Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 07197244 A2 **19950801** Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-352481 19931228.

AB The title Al alloy **sputtering target** contains .gtoreq.1 of metal at total amt. .ltoreq.20% selected from Mg .ltoreq.15, Ti .ltoreq.15, Zr .ltoreq.10, Hf .ltoreq.10, V .ltoreq.8, Nb .ltoreq.10, **Ta** .ltoreq.10, Cr .ltoreq.8, Mo .ltoreq.8, W .ltoreq.8, Mn .ltoreq.10, Co .ltoreq.10, and Ni .ltoreq.6% and 0.02-1.0% Si, Cu, or Fe. It has low thermal cond. and can be manufd. by **extrusion** molding. The title magnetooptical recording medium consists of a transparent substrate, successively laminated with 1st dielec. layer, magnetic recording film, 2nd dielec. layer prepd. by film-forming with the **sputtering target**, and a metal reflection layer.

IC ICM C23C014-34
ICS C22C021-00; G11B007-26; G11B011-10

CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 56

ST aluminum alloy **sputtering target** magnetooptical recording; **extrusion** moldability aluminum alloy **sputtering target**

IT Recording materials
(magnetooptical, Al alloy **sputtering target** with low thermal cond. and magnetooptical recording material)

IT 1312-81-8, Lanthanum oxide (La2O3) 7631-86-9, Silica, uses 12033-89-5, Silicon nitride (Si3N4), uses 116065-99-7, Silicon nitride (SiN1.1) 169257-73-2
RL: TEM (Technical or engineered material use); USES (Uses)
(dielec. layer; Al alloy **sputtering target** with low thermal cond. and magnetooptical recording material)

IT 12617-43-5P 162967-49-9P 169257-56-1P 169257-57-2P 169257-58-3P 169257-59-4P 169257-60-7P 169257-61-8P 169257-62-9P 169257-63-0P 169257-64-1P 169257-65-2P 169257-66-3P 169257-67-4P 169257-68-5P 169257-69-6P 169257-70-9P 169257-71-0P
RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(in **sputtering target**, for metal reflection layer; Al alloy **sputtering target** with low thermal cond.

and magnetooptical recording material)

IT 169257-72-1
RL: TEM (Technical or engineered material use); USES (Uses)
(recording layer; Al alloy **sputtering target** with
low thermal cond. and magnetooptical recording material)

L48 ANSWER 15 OF 15 HCA COPYRIGHT 2003 ACS on STN

123:131451 Multielement Characterization of High-**Purity** Titanium for Microelectronics by Neutron Activation Analysis. Wildhagen, Dieter; Krivan, Viliam (Sektion Analytik und Hoechstreinigung, Universitaet Ulm, Ulm, D-89069, Germany). Analytical Chemistry, 67(17), 2842-8 (English) 1995. CODEN: ANCHAM. ISSN: 0003-2700. Publisher: American Chemical Society.

AB A radiochem. neutron activation anal. technique for the detn. of 26 elements including the .alpha.-emitting elements Th and U and Cu, Fe, K, Na, Ni, and Zn was developed. The radiochem. sepn. was performed by anion exchange on a Dowex 1 .times. 8 column from HF and HF/NH4F medium. It leads to a selective removal of the matrix-produced radionuclides 46Sc, 47Sc, and 48Sc and a nearly selective isolation of 239Np and 233Pa, the indicator radionuclides of U and Th, resp. Counting the intensive but unspecific 511-keV .gamma.-ray of 64Cu was enabled by a selective extn. of copper with dithiazone from 15 M HF. For K, Na, Th, and U, a limit of detection of 30, 0.05, 0.03, and 0.07 ng/g, resp., was achieved. For the other elements, the detection limits were between 0.002 ng/g for Ir and 45 ng/g for Zr. The elements As, Cr, and Mn were assayed only by instrumental neutron activation anal. These techniques were applied to the anal. of two titanium **sputter target** materials of different **purity** grade. Results from seven elements are compared with those of isotope diln. and glow **discharge** mass spectrometry.

CC 79-6 (Inorganic Analytical Chemistry)

IT Radiochemical analysis
(neutron activation, multielement detn. in high-**purity** titanium by neutron activation anal.)

IT 7440-32-6, Titanium, analysis
RL: AMX (Analytical matrix); ANST (Analytical study)
(multielement detn. in high-**purity** titanium by neutron activation anal.)

IT 7439-88-5, Iridium, analysis 7439-89-6, Iron, analysis 7439-96-5, Manganese, analysis 7439-98-7, Molybdenum, analysis 7440-02-0, Nickel, analysis 7440-09-7, Potassium, analysis 7440-15-5, Rhenium, analysis 7440-17-7, Rubidium, analysis 7440-18-8, Ruthenium, analysis 7440-23-5, Sodium, analysis 7440-24-6, Strontium, analysis **7440-25-7, Tantalum**, analysis 7440-29-1, Thorium, analysis 7440-31-5, Tin, analysis 7440-33-7, Tungsten, analysis 7440-36-0, Antimony, analysis 7440-38-2, Arsenic, analysis 7440-39-3, Barium, analysis 7440-43-9, Cadmium, analysis 7440-46-2, Cesium, analysis 7440-47-3, Chromium, analysis 7440-48-4, Cobalt, analysis 7440-50-8, Copper, analysis 7440-55-3, Gallium, analysis 7440-58-6, Hafnium, analysis 7440-61-1, Uranium, analysis 7440-66-6, Zinc, analysis 7440-67-7, Zirconium, analysis 7440-74-6, Indium, analysis 7782-49-2, Selenium, analysis
RL: ANT (Analyte); ANST (Analytical study)
(multielement detn. in high-**purity** titanium by neutron activation anal.)

IT **7440-25-7, Tantalum**, analysis
RL: ANT (Analyte); ANST (Analytical study)
(multielement detn. in high-**purity** titanium by neutron activation anal.)

=> d L44 1-4 all

L44 ANSWER 1 OF 4 INSPEC (C) 2003 FIZ KARLSRUHE on STN
AN 1999:6337348 INSPEC DN A1999-19-6855-126
TI Effect of aluminium oxide caps on hillock formation in aluminium alloy films.
AU Iwamura, E.; Takagi, K.; Ohnishi, T. (Adv. Products Dev. Center, Kobe Steel Ltd., Japan)
SO Thin Solid Films (30 July 1999) vol.349, no.1-2, p.191-8. 21 refs.
Doc. No.: S0040-6090(99)00220-5
Published by: Elsevier
Price: CCCC 0040-6090/99/$20.00
CODEN: THSFAP ISSN: 0040-6090
SICI: 0040-6090(19990730)349:1/2L.191:EAOC;1-L
DT Journal
TC Experimental
CY Switzerland
LA English
AB The effect of surface oxide layers on thermally induced hillock formation was examined in AlTa and AlCu alloy films. An anodic oxide or a **sputter**-deposited oxide layer was intentionally formed on the top of the Al alloy films, and subsequently annealed in a vacuum of less than 1*10-4 Pa. Hillock formation on the encapsulated films, the dependence of hillock density on types and thickness of the oxides, and film stresses were investigated. It was observed that hillocks preferentially formed under the oxides and **extruded** out of the films, breaking through them. SEM and cross-sectional TEM micrographs revealed hillock growth along with the oxide/metal interface and deformation of the surface oxides following the change of surface topography by hillock formation. More than 100 nm in thickness of anodic oxide caps or a 230-nm thick **sputter** oxide were necessary to suppress hillock formation. An identical hillock density was obtained in each Al alloy film with encapsulation up to 62 nm in thickness, independent of the thickness and type of the oxide cap. The results indicate that surface conditions are unlikely to determine hillock density, and hillock suppression in the encapsulated films was presumably achieved by lower film stresses at elevated temperature resulting from higher initial tensile stresses induced by anodization and a smaller gradient of the stress-temperature curve of the metal/oxide multilayered films.
CC A6855 Thin film growth, structure, and epitaxy; A6820 Solid surface structure; A8160B Surface treatment and degradation of metals and alloys
CT ALUMINA; ALUMINIUM ALLOYS; ANNEALING; ANODISED LAYERS; COPPER ALLOYS; INTERNAL STRESSES; SCANNING ELECTRON MICROSCOPY; **SPUTTERED** COATINGS; SURFACE TOPOGRAPHY; **TANTALUM** ALLOYS; TRANSMISSION ELECTRON MICROSCOPY
ST aluminium alloy films; hillock formation; surface oxide layers; aluminium oxide caps; anodic oxide; **sputter-deposited oxide layer**; annealing; film stress; oxide thickness dependence; SEM; scanning electron microscopy; oxide metal interface; surface topography; surface oxide deformation; temperature dependence; metallization; 473 to 673 K; 20 to 100 nm; AlTa; AlCu; Al2O3-AlTa; Al2O3-AlCu
CHI AlTa sur, Al sur, Ta sur, AlTa bin, Al bin, Ta bin; AlCu sur, Al sur, Cu sur, AlCu bin, Al bin, Cu bin; Al2O3-AlTa int, Al2O3 int, AlTa int, Al2 int, Al int, O3 int, Ta int, O int, Al2O3 bin, AlTa bin, Al2 bin, Al bin, O3 bin, Ta bin, O bin; Al2O3-AlCu int, Al2O3 int, AlCu int, Al2 int, Al int, Cu int, O3 int, O int, Al2O3 bin, AlCu bin, Al2 bin, Al bin, Cu bin, O3 bin, O bin
PHP temperature 4.73E+02 to 6.73E+02 K; size 2.0E-08 to 1.0E-07 m
ET Al*Ta; Al sy 2; sy 2; Ta sy 2; AlTa; Al cp; cp; Ta cp; Al*Cu; Cu sy 2;

AlCu; Cu cp; Al; Pa; Al*O*Ta; Al sy 3; sy 3; O sy 3; Ta sy 3; Al2O3; O cp; Al2O3-AlTa; Al*Cu*O; Cu sy 3; Al2O3-AlCu; Ta; Cu; Al*O; Al2O; O

L44 ANSWER 2 OF 4 COMPENDEX COPYRIGHT 2003 EEI on STN
AN 1971(6):3131 COMPENDEX DN 710635375
TI Grain size refinement in a **tantalum** ingot.
AU FRIEDMAN GI (Whittaker Corp, Concord, Mass)
SO Met Trans v 2 n 1 Jan 1971 p 337-41
PY 1971
LA English
AB The object of the work described was to develop a thermomechanical procedure for reducing the grain size of a cast high- **purity** **tantalum** ingot to ASTM 5 (62 U) or finer under conditions such that the diameter of the **tantalum billet** was no smaller at the end of the working sequence than at the start. The treatment found successful consisted of upsetting 52% at 500 F, **extruding** 52% at room temperature to original size, and annealing at 2000 to 2200 F. 35375
CC 535 Rolling, Forging & Forming; 537 Heat Treatment; 543 Chromium, Manganese, Molybdenum, Tantalum, Tungsten, Vanadium & Alloys
CT ***TANTALUM** AND ALLOYS:Heat Treatment
ST THERMOMECHANICAL TREATMENT
ET U

L44 ANSWER 3 OF 4 NTIS COPYRIGHT 2003 NTIS on STN
AN 1989(13):09678 NTIS Order Number: DE88014581/XAB
TI Development of High Field Superconductors for High Energy Particle Physics: Progress Report, June 1, 1985-August 31, 1985.
CS Supercon, Inc., Natick, MA.
Sponsor: Department of Energy, Washington, DC. (100897000 9503112)
NR DE88014581/XAB; DOE/ER/40044-T9
4p; 1985
NC Contract(s): AC01-81ER40044
DT Report
CY United States
LA English
AV Portions of this document are illegible in microfiche products. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
NTIS Prices: PC A02/MF A01
OS GRA&I8904; ERA0000
AB During this quarter, the behavior of Nb and Cu when subjected to high temperatures was examined by measuring the microhardness vs. annealing time at 800/degree/C. this should help to more thoroughly understand the changes which would occur in the different conductor components when subjected to the heating inherent in the wire manufacturing process. Further experiments were also performed using the 1006 filament tubular conductor manufactured previously. A portion of this conductor was drawn, hexed (0.365''ff), straightened, cut to length, and restacked to form a 19114 filament trial **billet** (2'' OD) with a **Ta** diffusion barrier. After Hot Isostatic Pressing and inserting of Sn/endash/3 wt/percent/ Ti cores into the subelements, drawing of the restacked **billet** began at the end of this quarter. Results from the processing of this **billet** should help to determine whether or not HIP'ing is beneficial to the wire properties, and whether hexagonal subelements improve filament array uniformity. For the full scale **billets**, the preparation of **pure** copper hexagonal filler wire has begun. Also, two more monofilament

billets have been **extruded** to 0.840'' OD. While the first monofilaments produced had a Cu:Nb ratio of 1.2:1, these two batches of monofilament will have a Cu:Nb ratio of 1.6:1. Thus the filament spacing in the restacked **billets** will be different, which will help to determine the optimal spacing for prevention of bridging while maintaining current density.

CC 71N Nonferrous metals and alloys
71P Refractory metals and alloys

CT *Copper; *Niobium; Superconductors; Annealing; Drawing; Filaments; Microhardness; Pressing; Progress Report; Research Programs; Superconducting Composites; Tin
WIRES

UT ERDA/360100; ERDA/656100

L44 ANSWER 4 OF 4 NTIS COPYRIGHT 2003 NTIS on STN

AN 1968(31):00181 NTIS Order Number: AD-463 398/XAB

TI The Primary Working of Refractory Metals. Interim technical progress rept. no. 1, 1 Aug-29 Nov 64.

NR AD-463 398/XAB
34p; Nov 1964

NC Contract(s): AF 33(616)-8325

DT Progress Report

CY United States

LA English

AV Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
NTIS Prices: PC A03

OS GRA&I6803

AB Four **billets** of TMZ+1.5%NB were **extruded** during the reporting period using 4:1 and 6:1 ratios and temperatures of 2800 and 3200 F. Die angles of 60 degrees and 90 degrees were also used. Lower **extrusion** tonnages were required to **extrude** through 60 degree angle dies than through 90 degree angle dies. Fourteen chromium alloy, fifteen niobium alloy, seven **pure** copper, five **tantalum** alloy, one tungsten and thirteen tungsten alloy were **extruded** for other agencies. Twenty-four of the above **billets** were **extruded** for the Air Force Materials laboratory. (Author)

CC 94G Manufacturing processes and materials handling
71J Iron and iron alloys

CT *Refractory metals; *Material forming; **Extrusion**; Molybdenum alloys; Niobium alloys; **Tantalum alloys**; Chromium alloys; Copper; Tungsten; Tungsten alloys; Microstructure; Hardness; Lubricants; Glass
MOLYBDENUM ALLOY TZM; **BILLETS**; PRIMARY WORKING

=> d L45 1-19 ti

L45 ANSWER 1 OF 19 INSPEC (C) 2003 IEE on STN

TI High field Nb3Sn conductor development at Oxford Superconducting Technology.

L45 ANSWER 2 OF 19 INSPEC (C) 2003 IEE on STN

TI Hot impact **extrusion** and subsequent processing of some high temperature nickel base alloys.

L45 ANSWER 3 OF 19 COMPENDEX COPYRIGHT 2003 EEI on STN

TI High field Nb3 Sn conductor development at Oxford superconducting technology.

L45 ANSWER 4 OF 19 COMPENDEX COPYRIGHT 2003 EEI on STN
TI Superconductors and A.A. Bochvar.

L45 ANSWER 5 OF 19 COMPENDEX COPYRIGHT 2003 EEI on STN
TI DEPENDENCE OF SEVERAL **EXTRUSION** PARAMETERS ON THE **EXTRUSION** TEMPERATURE IN THE DIRECT **EXTRUSION** OF Al99.6.

L45 ANSWER 6 OF 19 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN
TI High field Nb3Sn conductor development at Oxford Superconducting Technology

L45 ANSWER 7 OF 19 NTIS COPYRIGHT 2003 NTIS on STN
TI Development of High Strength Columbium and **Tantalum** Alloy Tubing. First Quarterly progress rept. 1 Dec 1962-28 Feb 1963.

L45 ANSWER 8 OF 19 NTIS COPYRIGHT 2003 NTIS on STN
TI Development of High Strength Columbium and **Tantalum** Alloy Tubing. Quarterly progress rept. no. 2, 1 Mar 1962-31 May 1963.

L45 ANSWER 9 OF 19 NTIS COPYRIGHT 2003 NTIS on STN
TI Development of High Strength Columbium and **Tantalum** Alloy Tubing. Third Quarterly Progress rept 1 Jun-31 Aug 1963.

L45 ANSWER 10 OF 19 NTIS COPYRIGHT 2003 NTIS on STN
TI Testing Results of MF-Nb sub 3 Sn Composites Made by a Modified Jellyroll Method.

L45 ANSWER 11 OF 19 NTIS COPYRIGHT 2003 NTIS on STN
TI Study to Assess the Feasibility of Scaling Up the Powder Metallurgy Approach for the Fabrication of Commercial Nb sub 3 Sn Filamentary Superconductors.

L45 ANSWER 12 OF 19 NTIS COPYRIGHT 2003 NTIS on STN
TI Research and Development of Stabilized Multifilamentary Nb sub 3 Sn Superconductors. Technical Report, January 1, 1976--September 30, 1976.

L45 ANSWER 13 OF 19 NTIS COPYRIGHT 2003 NTIS on STN
TI **Extruding** and Drawing **Tantalum** Alloys to Complex Thin H-Section. Final technical rept. 1 Jul 63-31 Jan 66.

L45 ANSWER 14 OF 19 NTIS COPYRIGHT 2003 NTIS on STN
TI Development of Improved Cutting Tool Materials. Final technical rept. 16 Dec 66-15 Dec 69.

L45 ANSWER 15 OF 19 NTIS COPYRIGHT 2003 NTIS on STN
TI **Tantalum** Alloy Tubing Development Program. Final rept. 1 Jul 63-31 Mar 67.

L45 ANSWER 16 OF 19 NTIS COPYRIGHT 2003 NTIS on STN
TI **Tantalum** Alloy Tubing Development Program. Interim technical engineering rept. no. 5, 15 Jul 6431 Mar 65.

L45 ANSWER 17 OF 19 NTIS COPYRIGHT 2003 NTIS on STN
TI Columbium Alloy **Extrusion** Program. Final rept. for 15 Mar 60-16 Jan 62.

L45 ANSWER 18 OF 19 JICST-EPlus COPYRIGHT 2003 JST on STN

TI Isothermal forging process for oxide dispersion strengthened superalloy blades.

L45 ANSWER 19 OF 19 JICST-EPlus COPYRIGHT 2003 JST on STN
TI Technology for the control of Ni-base ODS alloy structure.

=> d L45 1,3,4 all

L45 ANSWER 1 OF 19 INSPEC (C) 2003 IEE on STN
AN 2003:7706896 INSPEC DN A2003-18-7460J-061; B2003-09-3220M-127
TI High field Nb3Sn conductor development at Oxford Superconducting Technology.
AU Parrell, J.A.; Youzhu Zhang; Field, M.B.; Cisek, P.; Seung Hong (Oxford Instruments, NJ, USA)
SO IEEE Transactions on Applied Superconductivity (June 2003) vol.13, no.2, pt.3, p.3470-3. 10 refs.
Published by: IEEE
Price: CCCC 1051-8223/03/$17.00
CODEN: ITASE9 ISSN: 1051-8223
SICI: 1051-8223(200306)13:2:3L.3470:HFNC;1-3
DT Journal
TC Experimental
CY United States
LA English
AB Oxford Instruments, Superconducting Technology (OI-ST) produces Nb3Sn wire via several "internal Sn" routes. Recently, 12 T, 4.2 K non-Cu critical current density (Jc) values of 2900 A/mm2 have been achieved by increasing the Nb and Sn fractions of the filament subelements. Similar conductors for high field use have shown engineering current density (Je) values of 170 A/mm2 at 23.5 T, 1.8 K. OI-ST is also involved with research for the High Energy Physics (HEP) National Conductor Program. Results on composites made entirely by hot **extrusion** are described. Finally, the present status of **Ta**-Sn powder-in-tube (PIT) and Nb3Al precursor strand development are presented. PIT strands have irreversibility fields over 26 T at 4.2 K, while Nb3Al precursor strand has been produced by a route that promotes bonding of the **billet** components.
CC A7460J Critical currents in type-II superconductors; A7470C Superconducting A15 compounds and alloys; B3220M Superconducting wires and tapes; B0550 Composite materials (engineering materials science)
CT CRITICAL CURRENT DENSITY (SUPERCONDUCTIVITY); **EXTRUSION**; MULTIFILAMENTARY SUPERCONDUCTORS; NIOBIUM ALLOYS; TIN ALLOYS
ST high-field Nb3Sn conductor; critical current density; engineering current density; **hot extrusion**; irreversibility field; multifilamentary wire; internal Sn process; composite superconductor; **Ta-Sn powder-in-tube strand**; Nb3Al precursor strand; **billet component bonding**; 26 T; 4.2 K; Nb3Sn; **Ta-Sn**
CHI Nb3Sn bin, Nb3 bin, Nb bin, Sn bin; TaSn bin, Sn bin, Ta bin
PHP magnetic flux density 2.6E+01 T; temperature 4.2E+00 K
ET Nb*Sn; Nb sy 2; sy 2; Sn sy 2; Nb3Sn; Nb cp; cp; Sn cp; Sn; Cu; Nb; Sn*Ta; Ta sy 2; Ta-Sn; Al*Nb; Al sy 2; Nb3Al; Al cp; TaSn; Ta cp; Ta

L45 ANSWER 3 OF 19 COMPENDEX COPYRIGHT 2003 EEI on STN
AN 2003(37):2760 COMPENDEX
TI High field Nb3 Sn conductor development at Oxford superconducting technology.
AU Parrell, Jeffrey A. (Oxford Instruments Superconducting Technology, Carteret, NJ 07008, United States); Zhang, Youzhu; Field, Michael B.;

Cisek, Paul; Hong, Seung
MT 2002 Applied Superconductivity Conference.
ML Houston, TX, United States
MD 04 Aug 2002-09 Aug 2002
SO IEEE Transactions on Applied Superconductivity v 13 n 2 III June 2003 2003.p 3470-3473
CODEN: ITASE9 ISSN: 1051-8223
PY 2003
MN 61374
DT Conference Article
TC Theoretical; Experimental
LA English
AB Oxford Instruments, Superconducting Technology (OI-ST) produces Nb3 Sn wire via several "internal Sn" routes. Recently, 12 T, 4.2 K non-Cu critical current density (Jc) values of [similar to]2900 A/mm2 have been achieved by increasing the Nb and Sn fractions of the filament subelements. Similar conductors for high field use have shown engineering current density (Je) values of 170 A/mm2 at 23.5 T, 1.8 K. OI-ST is also involved with research for the High Energy Physics (HEP) National Conductor Program. Results on composites made entirely by hot **extrusion** are described. Finally, the present status of **Ta** -Sn powder-in-tube (PIT) and Nb3Al precursor strand development are presented. PIT strands have irreversibility fields over 26 T at 4.2 K, while Nb3Al precursor strand has been produced by a route that promotes bonding of the **billet** components. 10 Refs.
CC 708.3 Superconducting Materials; 804.2 Inorganic Components; 701.1 Electricity: Basic Concepts and Phenomena; 932.1 High Energy Physics; 701.2 Magnetism: Basic Concepts and Phenomena; 931.3 Atomic and Molecular Physics
CT *Superconducting materials; Superconducting wire; Critical current density (superconductivity); Magnetic field effects; Nuclear magnetic resonance spectroscopy; High energy physics; Niobium compounds
ST Hydrostatic **extrusion**
ET Nb; Sn; Cu; Sn*Ta; Sn sy 2; sy 2; Ta sy 2; Ta-Sn; Al*Nb; Al sy 2; Nb sy 2; Nb3Al; Nb cp; cp; Al cp

L45 ANSWER 4 OF 19 COMPENDEX COPYRIGHT 2003 EEI on STN
AN 2003(5):2029 COMPENDEX
TI Superconductors and A.A. Bochvar.
AU Nikulin, A.D. (VNIINM, Moscow, Russian Federation)
SO Metallovedenie i Termicheskaya Obrabotka Metallov n 11 2002.p 38-46
CODEN: MTOMAX ISSN: 0026-0819
PY 2002
DT Journal
TC General Review
LA Russian
AB A problem of superconducting materials includes a study of complex electrophysical phenomena in materials being in superconducting state. Diffusion interaction of Nb and Sn at high temperatures is investigated. The technological regimes of deformation of the composites of Nb-Zr and Nb-Ti alloys with Cu in the hot and cold states are elaborated. The principle of sequential multiple **extrusion** of composite (single-core and multi-core) **billets** is the basis of technology. The solid-phase diffusion method ('bronze technology') is elaborated to prepare the multi-core superconductors, based on Nb3 Sn and V3Ga intermetallics. A role of alloying elements (**Ta**, Ti, Hf, Zr, Mg, Zn) in kinetics of forming the structure of the intermetallic layers is shown.(Edited abstract)
CC 931.1 Mechanics; 708.3 Superconducting Materials; 544.1 Copper; 535.2.2 Metal Forming Practice; 531.1 Metallurgy; 415 Metals, Plastics, Wood and

Other Structural Materials
CT *Superconducting materials; Copper; Composite materials; Alloying; Metal working; Intermetallics; Gallium; Diffusion; Zirconium; Vanadium; Titanium; Niobium
ST Multi-core cables
ET Nb; Sn; Nb*Zr; Nb sy 2; sy 2; Zr sy 2; Nb-Zr; Nb*Ti; Ti sy 2; Nb-Ti; Cu; Ga*V; Ga sy 2; V sy 2; V3Ga; V cp; cp; Ga cp; Ta; Ti; Hf; Zr; Mg; Zn

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FILE LAST UPDATED: 2 SEP 2003 <20030902/UP>
FILE COVERS APR 1973 TO MAY 30, 2003

<<< GRAPHIC IMAGES AVAILABLE >>>

=> d L75 1-3 ibib abs ind

L75 ANSWER 1 OF 3 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2000-104164 JAPIO
TITLE: **SPUTTERING TARGET**
INVENTOR: WATANABE KOICHI; KOSAKA YASUO; WATANABE TAKASHI; ISHIGAMI TAKASHI; SUZUKI YUKINOBU; FUJIOKA NAOMI
PATENT ASSIGNEE(S): TOSHIBA CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000104164	A	20000411	Heisei	C23C014-34

APPLICATION INFORMATION
STN FORMAT: JP 1999-180773 19990625
ORIGINAL: JP11180773 Heisei
PRIORITY APPLN. INFO.: JP 1998-182689 19980629
PRIORITY APPLN. INFO.: JP 1998-204001 19980717
PRIORITY APPLN. INFO.: JP 1998-212829 19980728
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000
AN 2000-104164 JAPIO
AB PROBLEM TO BE SOLVED: To provide a **sputtering target** capable of improving the electrical properties and quality of an Nb film as a liner material for an Al film at the time of forming an Al wiring film by the application of a DD wiring technique or the like.
SOLUTION: The **sputtering target** is composed of high **purity** Nb having <=3000 ppm **Ta** content and <=200 ppm oxygen content. Variations in the **Ta** content in the **sputtering target** are regulated to <=±30% over the entire target. Variations in the oxygen content are regulated to <=±80% over the entire target. Respective crystalline **grains** of Nb in the **sputtering target** have a **grain** size of 0.1 to 10 times against the average **grain** size, and the ratio of **grain** size between adjacent **grains** is regulated to 0.1-10. The above **sputtering target** can be suitably used for the formation of Nb films 6 as liner material for Al wirings 3, 7.
COPYRIGHT: (C)2000,JPO
IC ICM C23C014-34
ICS H01L021-285

ICA C22C027-02

L75 ANSWER 2 OF 3 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1995-197244 JAPIO
TITLE: AL ALLOY **SPUTTERING TARGET** AND MAGNETO-OPTICAL RECORDING MEDIUM
INVENTOR: KAWAGUCHI YUKIO; MATSUBUCHI SACHIKO
PATENT ASSIGNEE(S): TDK CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 07197244	A	19950801	Heisei	C23C014-34

APPLICATION INFORMATION
STN FORMAT: JP 1993-352481 19931228
ORIGINAL: JP05352481 Heisei
PRIORITY APPLN. INFO.: JP 1993-352481 19931228
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1995
AN 1995-197244 JAPIO
AB PURPOSE: To provide both the target low in thermal conductivity by a comparatively easy producing method such as **extrusion** method and the magneto-optical recording medium having a metallic reflection film layer formed by using the target and higher recording sensitivity.
CONSTITUTION: This Al-Me alloy (wherein Me are one or more metals selected among Mg, Ti, Zr, Hf, V, Nb, **Ta**, Cr, Mo, W, Mn, Co and Ni) has a <=20wt.% total Me content. The content of respective metals are contained within the following range: Mg<=15wt.%; Ti<=15wt.%; Zr<=10wt.%; Hf<=10wt.%; V<=8wt.%; Nb<=10wt.%; **Ta**<=10wt.%; Cr<=8wt.%; Mo<=8wt.%; W<=8wt.%; Mn<=10wt.%; Co<=10wt.%; and Ni<=6wt.%. Further, the alloy contains 0.02 to 1.0wt.% in total content of one or more elements selected among Si, Cu and Fe as the Z component.

IC ICM C23C014-34
ICS C22C021-00; G11B007-26; G11B011-10

L75 ANSWER 3 OF 3 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1986-116835 JAPIO
TITLE: **SPUTTERING TARGET** FOR LSI OR VERY LSI ELECTRODE WIRING MATERIAL
INVENTOR: NOZAWA YOSHIHARU; ISHIMARU YASUSHI; MIYAMORI SHIGEKI; FUKURAKU ATSUSHI; OSHIRO MASAHARU
PATENT ASSIGNEE(S): SHINKU YAKIN KK
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 61116835	A	19860604	Showa	H01L021-285

APPLICATION INFORMATION
STN FORMAT: JP 1984-237516 19841113
ORIGINAL: JP59237516 Showa
PRIORITY APPLN. INFO.: JP 1984-237516 19841113
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1986
AN 1986-116835 JAPIO
AB PURPOSE: To obtain high **purity** and ultra-fine crystal **grain** by adding at least a kind of alloyed element of Mo, W, Ti, **Ta**, Zr or Pt and Si in the 0.1∼8.5wt% to the base metal of

said Mo, W, Ti, **Ta**, Zr or Pt.
CONSTITUTION: When Si is added to Mo as an alloy element, as an example, and it is melted, Si exists within the alloy as a silicate, fine crystal organization in **grain** diameter of 0.5∼1mm can be obtained. When it is used for **sputtering target**, dielectivity of **sputtering** is uniform and mechanical workability is also good. The similar effect can also be obtained by adding W (added as WSi) and Si to the base material Mo and then melting them. However, amount of addition of alloyed component is limited to 0.1∼8.5wt%. If it is under 0.1wt%, it becomes difficult to obtain uniform fine crystal **grain** and mechanical working becomes also very difficult. Therefore, amount of addition should be set as small as possible and it is preferable to set the upper limit to 8.5wt%. In this case, initial discharge is stabilized and distribution of film thickness is also improved.
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IC ICM H01L021-285
ICS C23C014-14; C23C014-34

=> d L76 1-19 ibib abs ind

L76 ANSWER 1 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2002-363662 JAPIO
TITLE: METHOD FOR RECOVERY OF HIGH-**PURITY TANTALUM**, HIGH-**PURITY TANTALUM SPUTTERING TARGET**, AND THIN FILM DEPOSITED BY USING THIS **SPUTTERING TARGET**
INVENTOR: SHINDO YUICHIRO
PATENT ASSIGNEE(S): NIKKO MATERIALS CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2002363662	A	20021218	Heisei	C22B034-24

APPLICATION INFORMATION
STN FORMAT: JP 2001-166303 20010601
ORIGINAL: JP2001166303 Heisei
PRIORITY APPLN. INFO.: JP 2001-166303 20010601
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2002

AN 2002-363662 JAPIO

AB PROBLEM TO BE SOLVED: To provide a method for removing iron, niobium, tungsten, molybdenum, oxygen, carbon, or the like, which are get mixed in scrap, such as waste pieces of material, machining chips and surface-grinding-wheel swarf, generated in the course of a target-manufacturing process by a relatively simplified step and recovering high-**purity tantalum** reusable as a **tantalum** target at a low cost and also to provide a target obtained by using this high-**purity tantalum** and to prepare a thin film deposited by sputtering.
SOLUTION: The method for recovering high-**purity tantalum** comprises steps of: dissolving **tantalum** scrap, such as **tantalum** chips, by means of hydrofluoric acid or mixed acid of hydrofluoric acid and nitric acid and removing an undissolved residue; adding a potassium-containing salt to precipitate a **tantalum** fluoride potassium crystal; and further subjecting this **tantalum** fluoride potassium crystal to sodium reduction to obtain metal **tantalum** powder.

IC ICM C22B034-24
ICS B22F009-04; B22F009-24; C22B007-00; C22B009-22; C23C014-14; C23C014-34

L76 ANSWER 2 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2002-069624 JAPIO
TITLE: **SPUTTERING TARGET**
INVENTOR: WATANABE KOICHI; SUZUKI YUKINOBU; ISHIGAMI TAKASHI
PATENT ASSIGNEE(S): TOSHIBA CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2002069624	A	20020308	Heisei	C23C014-34

APPLICATION INFORMATION
STN FORMAT: JP 2000-261374 20000830
ORIGINAL: JP2000261374 Heisei
PRIORITY APPLN. INFO.: JP 2000-261374 20000830
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2002
AN 2002-069624 JAPIO
AB PROBLEM TO BE SOLVED: To effectively suppress the generation of a micro arc even if power supply to a target is increased in order to shorten a tact time necessary for sputtering when film-forming a Ge simple film, a Ge compound film, a Ge alloy film, and the like, by sputtering method.
SOLUTION: A **sputtering target** is composed of a high-**purity** Ge a Ge alloy containing, in the range of 0.1-50 atom.%, at least one element selected from Al, Si, Fe, Cr, **Ta**, Nb, Cu, Mn, Mo, W, Ni, Ti, Zr, Hf, Co, Ir, Pt, Ru, B and C. The content of Ag and that of Au in the high-**purity** Ge or the Ge alloy are 5 ppm or below, respectively. Further, the variation in the contents of Ag and Au in the whole target, is within 30%, respectively.

IC ICM C23C014-34
ICS C22C028-00; G11B007-26

L76 ANSWER 3 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2002-060934 JAPIO
TITLE: **SPUTTERING TARGET**
INVENTOR: WATANABE KOICHI; SUZUKI YUKINOBU; KOSAKA YASUO; ISHIGAMI TAKASHI
PATENT ASSIGNEE(S): TOSHIBA CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2002060934	A	20020228	Heisei	C23C014-34

APPLICATION INFORMATION
STN FORMAT: JP 2000-254477 20000824
ORIGINAL: JP2000254477 Heisei
PRIORITY APPLN. INFO.: JP 2000-254477 20000824
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2002
AN 2002-060934 JAPIO
AB PROBLEM TO BE SOLVED: To attain a stable plasma state over a long period of time in the case where e.g. a TaN film used as a barrier layer to a Cu wiring film is deposited by applying e.g. bias sputtering.

SOLUTION: A **sputtering target** composed of high **purity Ta** is used. The **high purity Ta** constituting the **sputtering target** contains 0.001-20 ppm of at least one element selected from Ag, Au and Cu each having self-sustaining discharge characteristics. These elements with self-sustaining discharge characteristics can accelerate the ionization of **Ta** and hereby plasma state can be stabilized. The variability in the contents of the elements having self- sustaining discharge characteristics is regulated to <=30% as the whole target.
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IC ICM C23C014-34
ICS C22C027-02; H01L021-203; H01L021-285

L76 ANSWER 4 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2002-038258 JAPIO
TITLE: **SPUTTERING TARGET**
INVENTOR: WATANABE KOICHI; WATANABE TAKASHI; ISHIGAMI TAKASHI
PATENT ASSIGNEE(S): TOSHIBA CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2002038258	A	20020206	Heisei	C23C014-34

APPLICATION INFORMATION
STN FORMAT: JP 2000-220983 20000721
ORIGINAL: JP2000220983 Heisei
PRIORITY APPLN. INFO.: JP 2000-220983 20000721
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2002

AN 2002-038258 JAPIO

AB PROBLEM TO BE SOLVED: To provide a **sputtering target** for forming a Ge based thin film such as a Ge film, a Ge compound film, and a Ge alloy film, which greatly improves a uniformity of the film thickness distribution.
SOLUTION: The **sputtering target** comprises high **purity** Ge or a Ge alloy which includes at least one of elements selected from the group consisting of B, C, Al, Si, Fe, Cr, **Ta**, Nb, Cu, Mn, Mo, W, Ni, Ti, Zr, Hf, Co, Ir and Ru, in a range of 0.1-50 atom%. The **sputtering target** also comprises that a ratio of a peak intensity of face (220) against a peak intensity of face (111) ((220)/(111)) is 0.3 or more, when a plane direction of the **sputtering target** surface is measured in a X-ray diffraction method, and further comprises that a spread of the peak-intensity ratio ((220)/(111)) on the total target-surface is within ±30%.
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IC ICM C23C014-34
ICS C22C028-00; G11B007-26

L76 ANSWER 5 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2001-303240 JAPIO
TITLE: **SPUTTERING TARGET**
INVENTOR: SUZUKI YUKINOBU; KOSAKA YASUO; FUJIOKA NAOMI; WATANABE TAKASHI; ISHIGAMI TAKASHI; WATANABE KOICHI
PATENT ASSIGNEE(S): TOSHIBA CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC

```
     JP 2001303240    A       20011031    Heisei  C23C014-34

APPLICATION INFORMATION
     STN FORMAT:            JP 2000-126599        20000426
     ORIGINAL:              JP2000126599          Heisei
PRIORITY APPLN. INFO.:      JP 2000-126599      20000426
SOURCE:                     PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined
                            Applications, Vol. 2001
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AN 2001-303240 JAPIO

AB PROBLEM TO BE SOLVED: To improve the Cu barrier property of TaN film the superior reproducibility in depositing a TaN film used, e.g. as a barrier layer for a Cu wiring film by means of reactive sputtering using a **Ta** target.

SOLUTION: The **sputtering target** is composed of at least either of high- **purity Ta** and high-**purity** TaN and contains high-**purity Ta** and N in amounts of <=2 atomic %, and Cu content in the target-constituting material is regulated to <=50 ppm. Further, the dispersion of Cu content in the whole target is controlled to <=±30%. By depositing the TaN film by means of reactive sputtering using such a **sputtering target**, the TaN film (barrier layer) excellent in Cu barrier property can be obtained with superior reproducibility.

IC ICM C23C014-34
ICS C22C027-02; C23C014-06; H01L021-203

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L76  ANSWER 6 OF 23  JAPIO  (C) 2003 JPO  on STN
ACCESSION NUMBER:           2000-323432    JAPIO
TITLE:                      SPUTTERING TARGET, WIRING FILM AND
                            ELECTRONIC PART
INVENTOR:                   WATANABE KOICHI; SUZUKI YUKINOBU; FUJIOKA NAOMI;
                            ISHIGAMI TAKASHI; KOSAKA YASUO
PATENT ASSIGNEE(S):         TOSHIBA CORP
PATENT INFORMATION:
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PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000323432	A	20001124	Heisei	H01L021-285

```
APPLICATION INFORMATION
     STN FORMAT:            JP 1999-130228        19990511
     ORIGINAL:              JP11130228            Heisei
PRIORITY APPLN. INFO.:      JP 1999-130228      19990511
SOURCE:                     PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined
                            Applications, Vol. 2000
```

AN 2000-323432 JAPIO

AB PROBLEM TO BE SOLVED: To provide a **sputtering target** through which a TaN film that is used as a barrier layer for Cu wirings and whose in-plane uniformity is, for instance, lens than 5% can be obtained with high reproducibility.

SOLUTION: A **sputtering target** is formed of high-**purity Ta** which contains 0.1 to 2 at.% nitrogen and high-**purity** TaN or high-**purity** TaN. Nitrogen contained in the **sputtering target** may vary from +30% to -30% in content. Nitrogen may be dissolved in **Ta** or may be present as TaN or may be present in a mixed-phase state. A wiring film is equipped with a TaN film which is formed using the above **sputtering target**, and concretely, the wiring film is equipped with a barrier layer of TaN film and a Cu film formed on it.

IC ICM H01L021-285
ICS C23C014-34

L76 ANSWER 7 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2000-212678 JAPIO
TITLE: HIGH **PURITY TANTALUM** FOR THIN FILM FORMATION AND ITS PRODUCTION
INVENTOR: SHINDO YUICHIRO; YAMAGUCHI SHUNICHIRO
PATENT ASSIGNEE(S): JAPAN ENERGY CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000212678	A	20000802	Heisei	C22C027-02

APPLICATION INFORMATION
STN FORMAT: JP 1999-12588 19990121
ORIGINAL: JP11012588 Heisei
PRIORITY APPLN. INFO.: JP 1999-12588 19990121
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000
AN 2000-212678 JAPIO
AB PROBLEM TO BE SOLVED: To suppress an abnormal discharging phenomenon and the generation of particles at the time of sputtering by sputtering **tantalum** in which each content of Nb, W, Mo, transition metal elements, high m.p. metal elements, heavy metal elements other than those, radioactive elements such as U and alkali metal elements is controlled to a ratio equal to or below the specified one.
SOLUTION: This high **purity tantalum** for thin film formation contains, by weight, <=10 ppm Nb, W and Mo, <=1 ppm transition metal elements, high m.p. metal elements and heavy metal elements other than those, <=1 ppb radioactive elements such as U and Th and <=1 ppm alkali metal elements such as Na and K. Each content of oxygen and carbon is desirably controlled to <=100 ppm. Ta_2O_5 is added to an electrolytic bath of fluoride-chloride or the like, and **tantalum** scrap having >=10% **tantalum** content is subjected to electrolytic refining at 600 to 1000°C. High **purity tantalum** powder electrodeposited on a cathode is press-formed and is thereafter uniformly melted by an electron beam or the like to form into an ingot, which is cut into a target shape to obtain a **sputtering target**.
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IC ICM C22C027-02
ICS C25C003-26

L76 ANSWER 8 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2000-058794 JAPIO
TITLE: SEMICONDUCTOR DEVICE
INVENTOR: YAMAZAKI SHUNPEI
PATENT ASSIGNEE(S): SEMICONDUCTOR ENERGY LAB CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000058794	A	20000225	Heisei	H01L027-108

APPLICATION INFORMATION
STN FORMAT: JP 1999-208783 19900724
ORIGINAL: JP11208783 Heisei
PRIORITY APPLN. INFO.: JP 1999-208783 19900724
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined

Applications, Vol. 2000

AN 2000-058794 JAPIO

AB PROBLEM TO BE SOLVED: To easily form a thin film transistor excellent characteristics by using a metal oxide film such as a dielectrics, such as **tantalum** oxide, and ferroelectrics, such as barium titanate, as a dielectrics film of a capacitor for a semiconductor integrated circuit.
SOLUTION: Related to a dielectrics film 11 of a capacitor, a target of a **tantalum** oxide is film-formed by oxygen-sputtering method. An insulating film 5 of **tantalum** oxide is formed over it. Al is formed by an electron beam vapor- deposition method as an upper side electrode to complete a capacitor. Here, a material used for sputtering should be of high **purity**. A **sputtering target**
, for example, is most preferred to be a **tantalum** to be a **tantalum** oxide or barium titanate of 4N or higher. As a gate insulating film of an insulating gate type field effect transistor 20, a silicon oxide through a thermal oxidation or that through a sputtering with 100% of oxygen is used. A lower side electrode 10 of a capacitor 21 is formed of a silicon semiconductor doped with phosphorous.
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IC ICM H01L027-108
ICS H01L021-8242; H01L021-316

L76 ANSWER 9 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2000-001774 JAPIO
TITLE: HIGH **PURITY** SR(X)BI(Y)**TA** (2)O(5+X+3Y/2) **SPUTTERING TARGET** MATERIAL
INVENTOR: SUZUKI SATORU; SUZUKI TSUNEO; SHINDO YUICHIRO
PATENT ASSIGNEE(S): JAPAN ENERGY CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000001774	A	20000107	Heisei	C23C014-34

APPLICATION INFORMATION
STN FORMAT: JP 1998-169900 19980617
ORIGINAL: JP10169900 Heisei
PRIORITY APPLN. INFO.: JP 1998-169900 19980617
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000

AN 2000-001774 JAPIO

AB PROBLEM TO BE SOLVED: To obtain a target material for forming a thin film in which leak current is reduced and the generation of soft errors is prevented by specifying the total content of Na, K, Mg, Fe, Ni, Co, Cr, Cu and Al and the content of each element of U and Th in a layered perovskite type oxide sintered body composed of specified ratios of Sr, Bi, **Ta** and O.
SOLUTION: In a **target** material for **sputtering** composed of a layered perovskite type oxide sintered body expressed by the general formula of SrxBiyTa2O5+x+3y/2 (where 0.7<x<1.2 and 2<y<3), the total content of Na, K, Mg, Fe, Ni, Co, Cr, Cu and Al is adjusted to <=100 ppm, preferably to <=10 ppm, and the content of each element of U and Th is adjusted to <=10 ppb, preferably to <=1 ppb. Moreover, as the starting raw materials of the target, SrCO3 powder, Bi2CO3 powder and Ta2O5 powder in which the contents of the impurities are controlled are used, which are sintered by a hot pressing method or the like and are subjected to HIP treatment to produce the target having >=98% relative density.
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IC ICM C23C014-34

ICS C01G035-00; C04B035-495; H01B003-12

L76 ANSWER 10 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1999-176769 JAPIO
TITLE: **SPUTTERING TARGET** AND COPPER WIRING FILM
INVENTOR: SATO MICHIO; KOSAKA YASUO
PATENT ASSIGNEE(S): TOSHIBA CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 11176769	A	19990702	Heisei	H01L021-285

APPLICATION INFORMATION
STN FORMAT: JP 1997-345394 19971215
ORIGINAL: JP09345394 Heisei
PRIORITY APPLN. INFO.: JP 1997-345394 19971215
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1999
AN 1999-176769 JAPIO
AB PROBLEM TO BE SOLVED: To provide a **sputtering target** and copper wiring film in which the target has a good fluidity sufficient to form a compact and a good-adhesion wiring film.
SOLUTION: This target comprises a high-**purity** Cu base contg. oxygen at 10 ppm or less, S at 1 ppm or less, and Fe at 1 ppm or less and has a **purity** of 99.999% or more, or a Cu base contg. at least one element at 0.5-250 ppm, selected from among Ti, Zr, V, Cr, Nb, **Ta**, U, La and Sc.
COPYRIGHT: (C)1999,JPO
IC ICM H01L021-285
ICS C22C009-00; C23C014-34

L76 ANSWER 11 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1996-147666 JAPIO
TITLE: MAGNETIC RECORDING MEDIUM AND ITS MANUFACTURE
INVENTOR: ASAKURA NORIYUKI; OYAMADA TADAAKI; FUKAZAWA FUMIO
PATENT ASSIGNEE(S): FUJITSU LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 08147666	A	19960607	Heisei	G11B005-66

APPLICATION INFORMATION
STN FORMAT: JP 1994-277893 19941111
ORIGINAL: JP06277893 Heisei
PRIORITY APPLN. INFO.: JP 1994-277893 19941111
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1996
AN 1996-147666 JAPIO
AB PURPOSE: To reduce medium noises by forming an undercoat Cr layer and a recording layer each in a predetermined thickness under predetermined conditions by sputtering.
CONSTITUTION: An Al substrate 11 processed through Ni-P plating 12 is subjected to texture treatment by a tape abrasion method to show a surface roughness of about 40-80Å. A Cr layer is formed as an undercoat layer 13 on the substrate 11 with the use of a **pure** Cr **target** by **sputtering**, and a Co-Cr- **Ta** based alloy layer as a recording layer 14 is formed on the layer 13. The Cr

undercoat layer 13 has a film thickness of 300Å or smaller and the recording layer 14 is a CoCrTa alloy layer composed of 12-17at.% of Cr, 2-5at.% of **Ta** and the remaining at.% of Co. The recording layer 14 has a coercive force of 1600Oe or larger. In this method, medium noises can be decreased.

IC ICM G11B005-66
ICS G11B005-85

L76 ANSWER 12 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1993-086456 JAPIO
TITLE: **TARGET** FOR **SPUTTERING**
INVENTOR: KINOSHITA MAKOTO; ISHII TOSHINORI; TAMURA JUN; KISHIDA KUNIO
PATENT ASSIGNEE(S): MITSUBISHI MATERIALS CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 05086456	A	19930406	Heisei	C23C014-14

APPLICATION INFORMATION
STN FORMAT: JP 1991-76575 19910409
ORIGINAL: JP03076575 Heisei
PRIORITY APPLN. INFO.: JP 1991-76575 19910409
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1993
AN 1993-086456 JAPIO
AB PURPOSE: To obtain a **target** for **sputtering** capable of obtaining a hard disk of high quality with high recording density at high yield by specifying the compsn. constituted of Cr, Pt, Ni, **Ta**, Pd, Nb and Co.
CONSTITUTION: This target is a **target** for **sputtering** contg., by weight, 5 to 20% Cr and 10 to 55% Pt, furthermore contg. each 0.1 to 20% of one or more kinds among Ni, **Ta**, Pd and Nb and/or each 0.01 to 7% of one or more kinds among Zr, Ti, Hf, Al, Si, Mo, W, V and Cu and/or each 0.005 to 3% of one or more kinds among Mg, Ca, La, Ce and Nd and the balance Co, and is suitably used at the time of sputtering a Cr-Pt-Co allay which is a magnetic material on a hard disk substrate. The above target is obtd. by uniformly mixing the raw material powder with high **purity** of Cr, Pt, Co or the like having a prescribed compsn. by a mixer and thereafter executing sintering by a hot press. Thus, the target is low sulfurized, by which lattice defect can be reduced.

IC ICM C23C014-14
ICS C23C014-34

L76 ANSWER 13 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1991-173704 JAPIO
TITLE: PRODUCTION OF **TARGET** FOR **SPUTTERING**
INVENTOR: ARIMOTO NOBUHIRO; SHIRAISHI HIROAKI; YAMAZAKI KOJI
PATENT ASSIGNEE(S): OSAKA TITANIUM CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 03173704	A	19910729	Heisei	B22F003-14

APPLICATION INFORMATION

STN FORMAT: JP 1989-313989 19891201
ORIGINAL: JP01313989 Heisei
PRIORITY APPLN. INFO.: JP 1989-313989 19891201
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1991
AN 1991-173704 JAPIO
AB PURPOSE: To produce a high **purity** target having high homogeneity and free from contamination by heavy metals, etc., by converting a refined hardly workable material into spherical powder by a plasma rotating electrode method, filling this powder into a capsule and carrying out hot isostatic pressing.
CONSTITUTION: A hardly workable material refined so as to obtain a prescribed compsn. is converted into spherical powder by a plasma rotating electrode method. This powder is filled into a capsule having the shape of a target and the capsule is hermetically sealed after degassing. The powder is then compression-molded by hot isostatic pressing and the capsule is removed to obtain a **target** for **sputtering**.
This method is effective in the case where Ti, Al or the silicide of Ti, W, Mo, Nb or **Ta** is used as starting material.
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IC ICM B22F003-14
ICS B22F009-10; C23C014-34

L76 ANSWER 14 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1991-130360 JAPIO
TITLE: **TARGET** FOR **SPUTTERING** AND ITS PRODUCTION
INVENTOR: SATO MICHIO; YAMANOBE TAKASHI; KAWAI MITSUO; KAWAGUCHI TATSUZO; MIHASHI KAZUHIKO; MIZUTANI TOSHIAKI
PATENT ASSIGNEE(S): TOSHIBA CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 03130360	A	19910604	Heisei	C23C014-34

APPLICATION INFORMATION
STN FORMAT: JP 1989-329678 19891221
ORIGINAL: JP01329678 Heisei
PRIORITY APPLN. INFO.: JP 1988-322423 19881221
PRIORITY APPLN. INFO.: JP 1988-325310 19881223
PRIORITY APPLN. INFO.: JP 1988-328441 19881226
PRIORITY APPLN. INFO.: JP 1989-194344 19890728
PRIORITY APPLN. INFO.: JP 1989-194346 19890728
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1991
AN 1991-130360 JAPIO
AB PURPOSE: To produce the **sputtering target** made of a high melting point metal silicide having a high density and high quality by mixing a specific high melting point metal and high **purity** Si in a powder state at a specific ratio, packing the mixture into a mold for a hot press, degassing the mixture in a vacuum, then pressurizing and molding the mixture and sintering the molding at a high temp.
CONSTITUTION: The fine powder of the high melting point metal M, such as W, Mo, Ti, Zr, Hf, Nb, or **Ta**, and the Si powder contg. at least one kind of B, P, Sb and As and having 0.01 to 1Ωcm electric resistivity are added and are mixed in a ball mill kept in a gaseous Ar atmosphere. This powder is packed into the mold made of high **purity** graphite for the hot press and is subjected to the vacuum degassing; thereafter, the powder is heated at a high temp. under

pressurization to synthesize MSi<SB>2</SB>; further, the temp. is raised and the powder is sintered. The granular MSi<SB>2</SB> phase disperses in the Si matrix phase. The **sputtering target** made of the high melting point metal silicide of the high density and high quality having the compsn. expressed by MSiX (X: 2 to 4), the boundary layer of 100 to 5000Å thickness at the boundary of the Si matrix phase and the MSi<SB>2</SB> phase and <=0.05μm surface roughness is thus produced.

IC ICM C23C014-34

L76 ANSWER 15 OF 23 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 1989-290766 JAPIO

TITLE: TI-CONTAINING HIGH-**PURITY TA** TARGET AND ITS PRODUCTION

INVENTOR: SAWADA SUSUMU; WADA HIRONORI; ASHIDA KOJI

PATENT ASSIGNEE(S): NIPPON MINING CO LTD

PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 01290766	A	19891122	Heisei	C23C014-34

APPLICATION INFORMATION

STN FORMAT: JP 1988-119079 19880518

ORIGINAL: JP63119079 Showa

PRIORITY APPLN. INFO.: JP 1988-119079 19880518

SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989

AN 1989-290766 JAPIO

AB PURPOSE: To develop the title Ti-contg. high-**purity Ta** sintered **target** for **sputtering** capable of forming a high-quality **Ta**<SB>2</SB>O<SB>5</SB> film by crushing the high-**purity** hydrides of **Ta** and Ti, mixing both materials in a specified ratio, dehydrogenating the mixture, sintering, and then homogenizing the product by heating.

CONSTITUTION: The **Ta** target is used when a high permittivity **Ta**<SB>2</SB>O<SB>5</SB> film is formed by sputtering as an insulating film between the electrode wiring layers in a semiconductor device. At the time of producing the target, the 5-6N high-**purity** **Ta** and Ti produced by the electron-beam melting method are heated in a hydrogen atmosphere, and hydrogenated to TaH<SB>2</SB> and TiH<SB>2</SB>. The hydrides are crushed, and mixed so that the Ti concn. is controlled to 0.1-2atom%. The mixture is heated in a vacuum to dehydrogenate the TaH<SB>2</SB> and TiH<SB>2</SB>, pressed, formed, hot-worked at high temp. and pressure, sintered, further heated at 1600-2000°C, and homogenized by mutual diffusion. By this method, a Ti-contg. high-**purity Ta** sitered **target** for **sputtering** capable of forming a **Ta**<SB>2</SB>O<SB>5</SB> film with an extremely less leakage current is produced.

IC ICM C23C014-34

ICS B22F009-04; B22F009-30; C22C001-04

L76 ANSWER 16 OF 23 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 1989-290765 JAPIO

TITLE: **SPUTTERING TARGET**

INVENTOR: FUKAZAWA MIHARU; YAMAGUCHI SATORU; ISHIHARA HIDEO

PATENT ASSIGNEE(S): TOSHIBA CORP

PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 01290765	A	19891122	Heisei	C23C014-34

APPLICATION INFORMATION
STN FORMAT: JP 1988-118429 19880516
ORIGINAL: JP63118429 Showa
PRIORITY APPLN. INFO.: JP 1988-118429 19880516
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989
AN 1989-290765 JAPIO
AB PURPOSE: To improve the quality of a deposit film to be obtained by means of sputtering by interposing a sheet metal of Mo and/or **Ta** between target pieces and a substrate to which the target pieces are to be attached at the time of producing a conjugate **target** for **sputtering** in which Mo and **Ta** are alternately combined.
CONSTITUTION: At the time of producing a conjugate **target** 1 for **sputtering** consisting of Mo and **Ta**, a sheet metal 7 consisting of high-**purity** Mo or **Ta** or a mixture of both is placed on a backing plate 6 made of copper and then high-**purity** Mo pieces 2 and **Ta** pieces 3 are alternately disposed on the above sheet metal 7, and this sheet metal 7 having the Mo and **Ta** pieces 2, 3 on the surface is fixed to the above backing plate 6 by means of an inside- peripheral ferrule 4 and an outside-peripheral ferrule 5. Since this **sputtering target** is free from deterioration in the quality of a thin sputtered film due to the contamination of the thin sputtered film by Cu in the backing plate by the presence of the sheet metal 7 composed of Mo, **Ta**, etc., even if gaps are formed between the Mo pieces 2 and the **Ta** pieces 3 as the result of long- period use, this **sputtering target** can withstand long use.

IC ICM C23C014-34

L76 ANSWER 17 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1989-096378 JAPIO
TITLE: CLAD **TARGET** MATERIAL FOR **SPUTTERING**
INVENTOR: ISHIKURA CHIHARU
PATENT ASSIGNEE(S): TANAKA KIKINZOKU KOGYO KK
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 01096378	A	19890414	Heisei	C23C014-34

APPLICATION INFORMATION
STN FORMAT: JP 1987-251179 19871005
ORIGINAL: JP62251179 Showa
PRIORITY APPLN. INFO.: JP 1987-251179 19871005
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989
AN 1989-096378 JAPIO
AB PURPOSE: To prevent a clad target from thermally adhering to a backing plate by joining a target material to a high-**purity** Ag substrate with a specific condition to form a clad target and then attaching the above to a backing plate.
CONSTITUTION: At the time of manufacturing a **sputtering target**, a **target** material 1 is joined to an Ag sheet 4 having >=99.5% **purity** and containing 100∼5,000wt.ppm, in

total, of at least one or more elements among Zn, In, Mn, Sb, Be, Ca, Cr, Te, Y, Nb, Mo, **Ta**, and Sn by a metal bonding agent 5 so as to be formed into a clad target 6, which is attached to a backing plate 3 made of Cu by means of an annular mounting fixture 2. Since this target is free from thermal adhesion between the backing plate 3 and the clad target 6 during use, the clad target 6 can be easily separated from the backing plate 3.

IC ICM C23C014-34
ICS H01J037-305; H01L021-285

L76 ANSWER 18 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1989-096374 JAPIO
TITLE: CLAD **TARGET** MATERIAL FOR **SPUTTERING**
INVENTOR: ISHIKURA CHIHARU
PATENT ASSIGNEE(S): TANAKA KIKINZOKU KOGYO KK
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 01096374	A	19890414	Heisei	C23C014-34

APPLICATION INFORMATION
STN FORMAT: JP 1987-251174 19871005
ORIGINAL: JP62251174 Showa
PRIORITY APPLN. INFO.: JP 1987-251174 19871005
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989

AN 1989-096374 JAPIO

AB PURPOSE: To prevent a clad target from thermally adhering to a backing plate by cladding a high-**purity** copper sheet containing trace amounts of specific elements with a **sputtering target** material.

CONSTITUTION: A Cu sheet 4 having >=99.7% **purity** and containing 100∼3,000wt. ppm, in total, of at least one or more elements among Zn, In, Mn, Sb, Be, Ca, Cr, Te, Y, Nb, Mo, **Ta**, and Sn is joined to a **sputtering target** material 1 by a metal bonding agent 5 made of In so as to be formed into a clad target material 6. The Cu sheet 4 of this clad target material 6 is attached to a backing plate 3 consisting of a Cu sheet with high thermal conductivity by means of an annular mounting fixture 2. By this method, the diffusion of the Cu sheet 4 of the clad target 6 into the backing plate 3 composed of Cu sheet in the course of sputtering and the resulting thermal adhesion between them can be prevented, by which the separation of the clad target 6 from the backing plate 3 is facilitated and, as a result, the exchanging operation of the target 6 can be facilitated.

IC ICM C23C014-34
ICS H01J037-305; H01L021-285

L76 ANSWER 19 OF 23 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1988-238265 JAPIO
TITLE: HIGH-MELTING POINT METAL SILICIDE TARGET AND ITS PRODUCTION
INVENTOR: SHIMOTORI KAZUMI; ISHIGAMI TAKASHI; KAWAI MITSUO
PATENT ASSIGNEE(S): TOSHIBA CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC

JP 63238265 A 19881004 Showa C23C014-34

APPLICATION INFORMATION
STN FORMAT: JP 1987-70289 19870326
ORIGINAL: JP62070289 Showa
PRIORITY APPLN. INFO.: JP 1987-70289 19870326
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1988
AN 1988-238265 JAPIO
AB PURPOSE: To produce the title target of the metal silicide having a specified composition by mixing a high-m.p. metal and Si, melting the mixture to alloy the materials, crushing the alloy, removing the excess Si, and sintering the crushed alloy at the time of producing a **sputtering target** with the silicide of a specified high-m.p. metal as the raw material.
CONSTITUTION: The high-**purity** silicide of a high-m.p. metal M such as Ti, Zr, **Ta**, Mo and W having the stoichiometrical composition of MSi<SB>n</SB> [(n) is the number of mols.] and contg. <200ppm O<SB>2</SB> and <1ppm alkali metal such as Na and K is used for producing a **sputtering target**. In this case, the high-m.p. metal M and Si are mixed to obtain the composition of MSi<SB>n</SB> (n>=2). The mixture is melted, solidified or sintered, and alloyed in a vacuum, the obtained alloy is crushed and treated with an aq. alkaline soln. of quaternary ammonium hydroxide, etc., to dissolve and remove the excess Si corresponding to (n-n'), and MSi<SB>n</SB>' (n>n'>2) is obtained. The contaminants such as Fe coming from a crusher during crushing are removed by pickling, etc., the crushed alloy is then molded and sintered in a vacuum, and the **sputtering target** of the high- **purity** metal silicide having the prescribed composition of MSi<SB>n</SB>' is produced.

IC ICM C23C014-34

=> file wpix
FILE 'WPIX' ENTERED AT 17:18:50 ON 14 OCT 2003

FILE LAST UPDATED: 14 OCT 2003 <20031014/UP>
MOST RECENT DERWENT UPDATE: 200366 <200366/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

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http://www.stn-international.de/training_center/patents/stn_guide.pdf <<<

>>> FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES, SEE http://thomsonderwent.com/coverage/latestupdates/ <<<

>>> FOR INFORMATION ON ALL DERWENT WORLD PATENTS INDEX USER GUIDES, PLEASE VISIT:

http://thomsonderwent.com/support/userguides/ <<<

=> d L92 1-13 all

L92 ANSWER 1 OF 13 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2003-091855 [08] WPIX
DNN N2003-072790 DNC C2003-023020
TI **Extruded tantalum** or niobium **billet**, for use as e.g. **sputtering target**, capacitor can or resistive film layer, has uniform average **grain** size.
DC M26 M29 U11 V05 X25
IN MICHALUK, C A
PA (MICH-I) MICHALUK C A; (CABO) CABOT CORP
CYC 99
PI US 2002157736 A1 20021031 (200308)* 19p C22C027-02
WO 2002088412 A2 20021107 (200308) EN C22F001-00
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG UZ VN YU ZA ZM ZW
ADT US 2002157736 A1 Provisional US 2001-261001P 20010111, US 2002-42549 20020109; WO 2002088412 A2 WO 2002-US23640 20020108
PRAI US 2001-261001P 20010111; US 2002-42549 20020109
IC ICM C22C027-02; C22F001-00
ICS C22F001-18
AB US2002157736 A UPAB: 20030204
NOVELTY - An **extruded tantalum** or niobium **billet** has a uniform average **grain** size of at most 150 (preferably 25-100) microns m.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for the production of the above **extruded tantalum** or niobium **billet** by **extruding** an ingot to at least partially recrystallize the **billet** during **extrusion**.
USE - The **billet** is for use in a **sputtering target**, a capacitor can, a resistive film layer, or an article (claimed). It can be used as feedstock for deep-drawing applications, e.g., cups, crucibles, and drawn seamless tubes.
ADVANTAGE - The **billet** has a **purity** of at least 99.995% (preferably 99.995-99.999%). It has good texture characteristics. It has more homogeneous deformation and work hardening throughout the workpiece during subsequent processing. This allows for a reduction in the temperature of subsequent annealing operations and allows for the attainment of a finer, more homogeneous microstructure in the final formed product than could otherwise be realized by conventional processing.
DESCRIPTION OF DRAWING(S) - The figure shows a flowchart of a typical commercial process compared to the above process.
Dwg.1/9
FS CPI EPI
FA AB; GI
MC CPI: M26-B13; M29-C01
EPI: U11-C09A; V05-F04B5C; V05-F05C; V05-F05E3; V05-F08D1A; X25-A04

L92 ANSWER 2 OF 13 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2003-028838 [02] WPIX
CR 2002-194602 [25]
DNN N2003-022685 DNC C2003-006598
TI **Tantalum sputtering target** formation method

for capacitor manufacture, involves performing **tantalum** mass
deformation followed by inert atmosphere high temperature annealing in
each processing stage.
DC M13 M29 U11 U12
IN TURNER, S P
PA (HONE) HONEYWELL INT INC
CYC 1
PI US 2002125128 A1 20020912 (200302)* 14p C23C014-34
ADT US 2002125128 A1 Div ex US 2000-497079 20000202, Provisional US
2000-236091P 20000928, Provisional US 2000-236110P 20000928, US
2001-999095 20011030
FDT US 2002125128 A1 Div ex US 6331233
PRAI US 2001-999095 20011030; US 2000-497079 20000202; US 2000-236091P
20000928; US 2000-236110P 20000928
IC ICM C23C014-34
ICS C22C014-00; C22F001-18
AB US2002125128 A UPAB: 20030111
NOVELTY - The **tantalum sputtering target** is
formed in three processing stages or more. In each stage, deformation of
tantalum mass is followed by inert atmosphere high temperature
annealing.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the
following:
(1) **sputtering target**; and
(2) **tantalum** thin film.
USE - For forming **tantalum sputtering**
target (claimed) used in formation of thin **tantalum** film
(claimed) in manufacture of capacitor for microcircuit applications.
ADVANTAGE - The high **purity tantalum**
sputtering target with mean fine **grain** size of
less than 100 microns and uniform crystallographic texture throughout the
target thickness, is produced by eliminating remnant as-cast **grain**
structure. The target exhibits smooth evenly **sputtered** surface.
Dwg.0/9
FS CPI EPI
FA AB
MC CPI: M13-G02A; M29-C
EPI: U11-C05G1B; U11-C09A; U12-C02X

L92 ANSWER 3 OF 13 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2003-019458 [01] WPIX
DNN N2003-014897 DNC C2003-005037
TI **Sputtering target** for use in forming thin film,
comprises titanium and zirconium, and has specific crystallographic
texture.
DC L02 L03 M13 U11 V05
IN TURNER, S P
PA (HONE) HONEYWELL INT INC
CYC 96
PI WO 2002088413 A2 20021107 (200301)* EN 20p C23C014-00
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ
NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK
DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR
KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU
SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
KR 2003024667 A 20030326 (200346) C23C014-34
ADT WO 2002088413 A2 WO 2001-US17670 20010531; KR 2003024667 A KR 2002-715221
20021113
PRAI US 2001-287880P 20010501

IC ICM C23C014-00; C23C014-34
AB WO 200288413 A UPAB: 20030101
NOVELTY - A **sputtering target** consists of titanium and zirconium. It has (103), (102), or (002) crystallographic texture.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for formation of thin film by **sputtering** the **target** in an atmosphere containing nitrogen or a mixture of nitrogen and oxygen, while exposing the target to at least 20 kW power.
USE - For use in the formation of titanium/zirconium thin film (24) useful as copper diffusion-barrier layer.
ADVANTAGE - The inventive target has a uniform texture across its surface and throughout its thickness. It exhibits an increased mechanical strength compared to high-**purity** titanium and **tantalum**
.
DESCRIPTION OF DRAWING(S) - The figure is a diagrammatic cross-sectional view of a semiconductor construction.
Titanium/zirconium thin film 24
Dwg.4/6
FS CPI EPI
FA AB; GI
MC CPI: L03-H04D; L04-C12A; M13-G02A
EPI: U11-C05B2; U11-C05B9A; V05-F04B5C; V05-F05C; V05-F05E3; V05-F08D1A

L92 ANSWER 4 OF 13 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2003-016429 [01] WPIX
DNN N2003-012349 DNC C2003-003985
TI Refractory metal plate used as **sputtering targets**, furnace components, has thickness, center and edge comprising uniform texture through thickness from center to edge.
DC L02 L03 M13 M26 U11 V05
IN JEPSON, P R; KUMAR, P; UHLENHUT, H
PA (STAR-N) STARCK INC H C; (JEPS-I) JEPSON P R; (KUMA-I) KUMAR P; (UHLE-I) UHLENHUT H
CYC 98
PI US 2002112789 A1 20020822 (200301)* 12p C22C027-02
WO 2002070765 A1 20020912 (200301) EN C22C027-02
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
ADT US 2002112789 A1 Provisional US 2001-269983P 20010220, US 2002-79286 20020220; WO 2002070765 A1 WO 2002-US5033 20020220
PRAI US 2001-269983P 20010220; US 2002-79286 20020220
IC ICM C22C027-02
ICS C21C001-00; C22F001-02; C22F001-16; C23C014-34
AB US2002112789 A UPAB: 20030101
NOVELTY - The refractory metal plate (40) has a thickness, a center and an edge comprising a uniform texture through thickness from center to edge.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:
(1) a method of making a **sputtering target**;
(2) a method for producing a refractory metal plate;
(3) a method for controlling texture of **sputtering target**;
(4) a method for producing a metal article with fine metallurgical structure and uniform texture; and
(5) a **sputtering target**.
USE - As **sputtering targets** and other plate

products, as furnace components, turbine blades, aerospace and engine component, as products of containers and patches for highly corrosive chemical environment, and for chemical, medical, electrical applications.

ADVANTAGE - The **sputtering target** and the other plate products with high **purity**, fine **grain** size, high strength and uniform texture structure, are formed from ingots of **pure** refractory metals. The **sputtering target** improves the predictability of thickness of the film produced, hence the ease of use of the target is improved. The **sputtering target** is manufactured from a given mass of **tantalum** ingot, improving cost-efficiency of the process. The plates can also be unbroken or drilled with holes or can be an expanded mesh. The plates having microstructures and **grain** uniformity, can be used for chemical, medical, electrical and high temperature resistance applications (furnace components, aerospace foils, turbine blades) and as products of containers and patches for highly corrosive chemical environment. The refractory metal plate has high microstructural uniformity.

DESCRIPTION OF DRAWING(S) - The figure shows the flow chart of process of the refractory metal plate production.

refractory metal plate 40

Dwg.1/9

FS CPI EPI
FA AB; GI
MC CPI: L02-E01; L03-H04D; M13-G02A; M26-B
EPI: U11-C09A; V05-F04B5C; V05-F05C; V05-F05E3; V05-F08D1A

L92 ANSWER 5 OF 13 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2002-130539 [17] WPIX
DNN N2002-098478 DNC C2002-040073
TI Homogeneous **sputtering target** testing involves sonic irradiation to produce echoes, which are sorted according to indicate presence or not of inhomogeneity, then clustering echoes to generate information about inhomogeneity.
DC J04 S03
IN FLEMING, R H; GORE, R B
PA (HONE) HONEYWELL INT INC
CYC 96
PI WO 2001092868 A2 20011206 (200217)* EN 41p G01N029-04
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
AU 2001075007 A 20011211 (200225) G01N029-04
US 6439054 B1 20020827 (200259) G01N029-04
TW 511205 A 20021121 (200353) H01L021-66
ADT WO 2001092868 A2 WO 2001-US17342 20010529; AU 2001075007 A AU 2001-75007 20010529; US 6439054 B1 US 2000-585242 20000531; TW 511205 A TW 2001-113214 20010830
FDT AU 2001075007 A Based on WO 2001092868
PRAI US 2000-585242 20000531
IC ICM G01N029-04; H01L021-66
ICS C23C014-34; G01N029-20
AB WO 200192868 A UPAB: 20020313
NOVELTY - Testing homogeneous materials for inhomogeneities involves sonically irradiating positions across a material, detecting echoes and associating with the position that triggered the echo, processing information relating to echo to sort them into groups indicative and not indicative of inhomogeneities. Echoes in the first groups are clustered at

adjacent positions of the material, and analyzed to generate information about an inhomogeneity in the material.

DETAILED DESCRIPTION - Testing homogeneous materials for inhomogeneities (40,42) involves sonically irradiating (22) positions across at least part of a material (10), detecting echoes (24) induced by inhomogeneities and associating with the position that triggered the echo, processing (34) information relating to at least one physical attribute of the echo to sort them into groups indicative and not indicative of inhomogeneities. Echoes in the first groups are clustered at adjacent positions of the material, and analyzed to generate information about an inhomogeneity in the material.

USE - For non-destructive evaluation of **sputtering target** materials.

ADVANTAGE - Use of ultrasonics ensures non-destructive testing. This is important as integrated circuit devices become increasingly smaller, with decreased tolerance for uniformity and undesired particles. Previous ultrasonic methods cannot differentiate between different types of defect, and thus do not consider differences in ultrasonic response to the various types of defect. Other problems relate to incomplete accounting of depth effect, and further by considering one point per effect, rather than in this technique, a number of points per defect. Non-uniform erosion of the target is considered as a function of the erosion profile.

DESCRIPTION OF DRAWING(S) - The diagram shows an ultrasonic **sputtering target** testing system.

target 10
transducer 20
ultrasonic pulse 22
echo 24
processor 34
inhomogeneities 40,42
Dwg.2/12

FS CPI EPI
FA AB; GI
MC CPI: J04-C
EPI: S03-E08A; S03-E08X

L92 ANSWER 6 OF 13 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2001-581084 [65] WPIX
DNN N2001-432852 DNC C2001-172167
TI **Sputtering target** used in electronics and semiconductor industries for deposition of thin films is manufactured in a process that includes equal channel angular **extrusion**.
DC L03 M13 M26 M29 U11 V05
IN FERRASSE, S; SEGAL, V; WILLETT, W B
PA (HONE) HONEYWELL INC; (HONE) HONEYWELL INT INC; (FERR-I) FERRASSE S; (SEGA-I) SEGAL V; (WILL-I) WILLETT W B
CYC 92
PI WO 2001044536 A2 20010621 (200165)* EN 38p C23C014-34
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
AU 2001021030 A 20010625 (200165) C23C014-34
US 2001054457 A1 20011227 (200206) C22C021-12
US 2002000272 A1 20020103 (200207) C23C014-00
US 2002007880 A1 20020124 (200210) C22C021-12
EP 1242645 A2 20020925 (200271) EN C23C014-34
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT

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          RO SE SI TR
     KR 2002074171 A  20020928 (200313)             C23C014-34
     JP 2003517101 W  20030520 (200334)      52p    C23C014-34
ADT  WO 2001044536 A2 WO 2000-US33997 20001215; AU 2001021030 A AU 2001-21030
     20001215; US 2001054457 A1 Div ex US 1999-465492 19991216, US 2001-912476
     20010724; US 2002000272 A1 Div ex US 1999-465492 19991216, US 2001-912616
     20010724; US 2002007880 A1 Div ex US 1999-465492 19991216, US 2001-912652
     20010724; EP 1242645 A2 EP 2000-984408 20001215, WO 2000-US33997 20001215;
     KR 2002074171 A KR 2002-707767 20020617; JP 2003517101 W WO 2000-US33997
     20001215, JP 2001-545613 20001215
FDT  AU 2001021030 A Based on WO 2001044536; EP 1242645 A2 Based on WO
     2001044536; JP 2003517101 W Based on WO 2001044536
PRAI US 1999-465492   19991216; US 2001-912476   20010724; US 2001-912616
     20010724; US 2001-912652   20010724
IC   ICM  C22C021-12; C23C014-00; C23C014-34
     ICS  B21C023-00; B22D007-00; C22F001-04
ICA  C22F001-00
AB   WO 200144536 A UPAB: 20011108
```

NOVELTY - A **sputtering target** (1) comprises a target surface having homogeneous composition; uniform structure and texture at any location; a **grain** size of at most 1 microns , and absence of precipitates, voids, pores, inclusions and other casting defects.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(A) a method of fabricating an article for use as a **sputtering target** comprising providing a cast ingot, homogenizing the ingot at time and temperature for redistribution of macro-segregations and micro-segregations, and subjecting the ingot to equal channel angular **extrusion** to refine the **grains**;

(B) a **billet** for equal channel angular **extrusion** of targets fabricated from a cast ingot; and

(C) a method of controlling the texture of an alloy comprising defining equal channel angular **extrusion** routes for defining predetermined shear planes and crystallographic directions in the alloy, selecting a route(s) from the defined routes for plastically deforming the alloy during equal channel angular **extrusion**, and subjecting the alloy to pass through the selected routes.

USE - Used in electronics and semiconductor industries for deposition of thin films.

ADVANTAGE - The invention is of high quality, has fine and uniform **grain** structure, and has high **purity**.

DESCRIPTION OF DRAWING(S) - The figure shows a schematic diagram of the apparatus.

Sputtering target 1

Dwg.11/11

```
FS   CPI EPI
FA   AB; GI
MC   CPI: L04-D02; M13-G02; M26-B; M29-A; M29-B; M29-C01
     EPI: U11-C09A; V05-F04B5C; V05-F05E3; V05-F08D1A

L92  ANSWER 7 OF 13  WPIX  COPYRIGHT 2003 THOMSON DERWENT on STN
AN   2001-182284 [18]   WPIX
DNC  C2001-054241
```

TI Formation of **tantalum sputter target** useful in manufacturing electrical components, involves plastically deforming and upsetting **tantalum billet**.

```
DC   M13 M29
IN   ZHANG, H
PA   (TOYJ) TOSOH SMD INC
CYC  1
PI   US 6193821    B1 20010227 (200118)*      8p    C22F001-18
```

ADT US 6193821 B1 Provisional US 1998-97153P 19980819, US 1999-353700 19990714
PRAI US 1998-97153P 19980819; US 1999-353700 19990714
IC ICM C22F001-18
AB US 6193821 B UPAB: 20010402
NOVELTY - A **tantalum sputter target** having (222) texture and **grain** sizes of 20-25 mu m is formed by providing a **tantalum billet** with a centerline. The **billet** is plastically deformed to reduce its first dimension normal to the centerline, and then upset to reduce its second dimension normal to the first dimension.
USE - The process is for forming **sputter targets** used in the manufacture of electrical components and other industrial products.
ADVANTAGE - The **sputter target** produced has higher **sputtering** rates, and deposits more uniform metallic films on the substrates.
Dwg.0/3
FS CPI
FA AB
MC CPI: M13-G02; M29-C01

L92 ANSWER 8 OF 13 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2001-171507 [18] WPIX
DNN N2001-123895 DNC C2001-051455
TI Manufacture of ferromagnetic **sputter target** for magnetron cathode **sputtering**, comprises forming **target** blank from a ferromagnetic material of specified intrinsic magnetic permeability, and deforming into a non-planar **sputter target**.
DC L03 V05 X25
IN HOO, H; MCDONALD, P; XIONG, W
PA (PRAX-N) PRAXAIR ST TECHNOLOGY INC
CYC 3

PI	GB 2353294 A	20010221 (200118)*		25p	C23C014-35
	JP 2001115258 A	20010424 (200130)		7p	C23C014-34
	KR 2001050049 A	20010615 (200171)			C23C014-35

ADT GB 2353294 A GB 2000-16774 20000707; JP 2001115258 A JP 2000-247144 20000817; KR 2001050049 A KR 2000-46537 20000811
PRAI US 1999-377587 19990819
IC ICM C23C014-34; C23C014-35
ICS G11B005-851; H01F010-16; H01F041-18; H01J037-34
AB GB 2353294 A UPAB: 20010402
NOVELTY - A non-planar ferromagnetic **sputter target** is made by forming a target blank from a ferromagnetic material of intrinsic magnetic permeability greater than 1.0, and deforming the target blank into a non-planar **sputter target**. The magnetic permeability of the ferromagnetic material is decreased from the intrinsic value in at least a portion of the **sputter target**.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a non-planar ferromagnetic **sputter target** made by the above method.
USE - Used in manufacturing ferromagnetic **sputter target** in the magnetron cathode sputtering of magnetic thin films. The **sputter target** is used in thin film deposition in industries e.g. data storage and very large scale integration semiconductor.
ADVANTAGE - The low magnetic permeability of the ferromagnetic materials results in a significant increase in the magnetic flux at the surface of the ferromagnetic targets and a lowering of the argon pressure needed to obtain stable plasma. Also allows for an increase in target

thickness, which produces a longer target life and decreases the frequency of target replacements. It enables high rate deposition, uniform film thickness, and higher target utilization.
Dwg.0/2

FS CPI EPI
FA AB
MC CPI: L03-B05E; L03-H04D
EPI: V05-F04B5C; V05-F05C3A; V05-F08D1A; X25-A04

L92 ANSWER 9 OF 13 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2000-441864 [38] WPIX
DNC C2000-134142
TI **Tantalum** metal as a **sputtering agent**, e.g. for capacitors, has high **purity** and specified average **grain** size.
DC L03 M25
IN HUBER, L E; KAWCHAK, M N; MAGUIRE, J D; MICHALUK, C A
PA (CABO) CABOT CORP; (HUBE-I) HUBER L E; (KAWC-I) KAWCHAK M N; (MAGU-I) MAGUIRE J D; (MICH-I) MICHALUK C A
CYC 89
PI WO 2000031310 A1 20000602 (200038)* EN 54p C22B034-24
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
AU 2000019204 A 20000613 (200043) C23C014-34
EP 1137820 A1 20011004 (200158) EN C22B034-24
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
KR 2001080585 A 20010822 (200213) C23C014-34
BR 9915674 A 20020122 (200216) C22B034-24
US 6348113 B1 20020219 (200221) C22F001-18
US 2002026965 A1 20020307 (200221) C22C027-02
CN 1333838 A 20020130 (200231) C22B034-24
JP 2002530534 W 20020917 (200276) 79p C22B034-24
US 2003037847 A1 20030227 (200318) C22B034-24
AU 764689 B 20030828 (200361) C23C014-34
MX 2001005264 A1 20020601 (200365) C22B034-24
ADT WO 2000031310 A1 WO 1999-US27832 19991124; AU 2000019204 A AU 2000-19204 19991124; EP 1137820 A1 EP 1999-962850 19991124, WO 1999-US27832 19991124; KR 2001080585 A KR 2001-706587 20010525; BR 9915674 A BR 1999-15674 19991124, WO 1999-US27832 19991124; US 6348113 B1 US 1998-199569 19981125; US 2002026965 A1 Cont of US 1998-199569 19981125, US 2001-922815 20010806; CN 1333838 A CN 1999-815703 19991124; JP 2002530534 W WO 1999-US27832 19991124, JP 2000-584117 19991124; US 2003037847 A1 Cont of US 1998-199569 19981125, Cont of US 2001-922815 20010806, US 2002-145336 20020514; AU 764689 B AU 2000-19204 19991124; MX 2001005264 A1 WO 1999-US27832 19991124, MX 2001-5264 20010525
FDT AU 2000019204 A Based on WO 2000031310; EP 1137820 A1 Based on WO 2000031310; BR 9915674 A Based on WO 2000031310; JP 2002530534 W Based on WO 2000031310; US 2003037847 A1 Cont of US 6348113; AU 764689 B Previous Publ. AU 2000019204, Based on WO 2000031310; MX 2001005264 A1 Based on WO 2000031310
PRAI US 1998-199569 19981125; US 2001-922815 20010806; US 2002-145336 20020514
IC ICM C22B034-24; C22C027-02; C22F001-18; C23C014-34
ICS B22F009-24; C22B003-44; C22B009-04; C22B009-20; C22B009-22
ICA C22F001-00

AB WO 200031310 A UPAB: 20000811
NOVELTY - **Tantalum** metal has a **purity** of at least 99.95% and an average **grain** size of 150 microns or less.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for (i) a metal alloy, a **sputtering target**, a capacitor can, a resistive film layer, and an article, each comprising the above mentioned **tantalum** metal; (ii) a process of making a **sputtering target** comprising mechanically or chemically cleaning surfaces of the **tantalum** metal, flat forging the **tantalum** metal into a rolling slab(s), mechanically or chemically cleaning surfaces of the slab(s), annealing the slab(s) at a sufficient temperature for a period of time to achieve at least a partial recrystallization, cold or warm rolling the slab(s) in both the perpendicular and parallel directions to form a plate(s), flattening the plate(s), and annealing the plate(s) to have an average **grain** size at most 150 mu and a texture void of textural bands; and (iii) a process for making the **tantalum** metal comprising reacting a salt containing **tantalum** with an agent(s) capable of reducing the salt to **tantalum**, and a second salt in a reaction container having an agitator. The reaction container or a liner in the reaction container and the agitator or a liner on the agitator are made from a metal material having the same or higher vapor pressure of **tantalum** at its melting point.
USE - For use as a **sputtering** agent, e.g. for capacitors.
ADVANTAGE - The **tantalum** metal has a texture in which a pole figure has a center peak intensity of at most 15 random, and/or a log ratio of center peak intensities of at least neg. 1.5-15. The metal has an average **grain** size of 25-150 mu or less, and a **purity** of 99.999%. It also has fine and uniform microstructure.
Dwg.0/11
FS CPI
FA AB
MC CPI: L03-B03; L03-H04D; M25-G28

L92 ANSWER 10 OF 13 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2000-117176 [10] WPIX
DNN N2000-088709 DNC C2000-035916
TI **Sputter target.**
DC L03 M13 U11 V05 X14
IN FUJIOKA, N; ISHIGAMI, T; KOHSAKA, Y; SUZUKI, Y; WATANABE, K; WATANABE, T
PA (TOKE) TOSHIBA KK; (TOKE) TOSHIBA CORP
CYC 22
PI WO 2000000661 A1 20000106 (200010)* JA 34p C23C014-34
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: KR US
JP 2000104164 A 20000411 (200029) 11p C23C014-34
EP 1099777 A1 20010516 (200128) EN C23C014-34
R: DE FR GB IT
KR 2001053199 A 20010625 (200173) H01L021-203
TW 460600 A 20011021 (200248) C23C014-34
ADT WO 2000000661 A1 WO 1999-JP3407 19990625; JP 2000104164 A JP 1999-180773 19990625; EP 1099777 A1 EP 1999-926824 19990625, WO 1999-JP3407 19990625; KR 2001053199 A KR 2000-714793 20001226; TW 460600 A TW 1999-110902 19990628
FDT EP 1099777 A1 Based on WO 2000000661
PRAI JP 1998-212829 19980728; JP 1998-182689 19980629; JP 1998-204001 19980717
IC ICM C23C014-34; H01L021-203
ICS H01L021-285
ICA C22C027-02
AB WO 200000661 A UPAB: 20000228

NOVELTY - A **sputter target** consisting of a high **purity** Nb containing not more than 3000 ppm of **Ta** and not more than 200 ppm of oxygen, with variations in **Ta** content limited to within +/-30% through the whole target and variations in oxygen content to within +/-80% throughout the whole target, thereby implementing a low-resistivity wiring film. In addition, each Nb crystal **grain** in the **sputter target** has a **grain** size 0.1 to 10 times the average crystal **grain** size and a **grain** size ratio between adjacent crystal **grains** is 0.1 to 10. Such a **sputter target** can minimize the occurrence of giant dust and is suitable for forming an Nb film used as a liner material for Al wiring.

USE - **Sputter target**.

Dwg.1/1

FS CPI EPI
FA AB; GI
MC CPI: L04-D02; M13-G02
EPI: U11-C09A; V05-F04B5C; V05-F05C; V05-F08D1A; X14-F02

L92 ANSWER 11 OF 13 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2000-106113 [09] WPIX
DNN N2000-081474 DNC C2000-031943
TI Metal article useful as **sputtering target** for electronics and semiconductor industries.
DC L03 M13 P51 P73 X25
IN SEGAL, V; SHAH, R P
PA (JOHO) JOHNSON MATTHEY ELECTRONICS INC; (HONE) HONEYWELL ELECTRONIC MATERIALS INC; (SEGA-I) SEGAL V; (SHAH-I) SHAH R P; (HONE) HONEYWELL INT INC
CYC 26

PI	WO 9966100	A1	19991223	(200009)*	EN	15p	C23C014-34
	RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE						
	W: CN DE GB JP KR SE SG						
	EP 1088115	A1	20010404	(200120)	EN		C23C014-34
	R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE						
	CN 1307646	A	20010808	(200173)			C23C014-34
	KR 2001071476	A	20010728	(200208)			C22C027-02
	US 6348139	B1	20020219	(200221)			C23C014-34
	US 2002063056	A1	20020530	(200240)			C22C027-02
	JP 2002518593	W	20020625	(200243)		18p	C23C014-34
	US 2002153248	A1	20021024	(200273)			C23C014-34
	TW 515848	A	20030101	(200355)			C23C014-00
	MX 2000012453	A1	20020401	(200363)			B21C001-00

ADT WO 9966100 A1 WO 1998-US18676 19980908; EP 1088115 A1 EP 1998-945933 19980908, WO 1998-US18676 19980908; CN 1307646 A CN 1998-814118 19980908; KR 2001071476 A KR 2000-714206 20001214; US 6348139 B1 US 1998-98760 19980617; US 2002063056 A1 Div ex US 1998-98760 19980617, US 2001-14310 20011211; JP 2002518593 W WO 1998-US18676 19980908, JP 2000-554901 19980908; US 2002153248 A1 Cont of US 1998-98760 19980617, Div ex US 2001-14310 20011211, US 2002-122042 20020412; TW 515848 A TW 1999-106727 19990427; MX 2000012453 A1 WO 1998-US18676 19980908, MX 2000-12453 20001214
FDT EP 1088115 A1 Based on WO 9966100; JP 2002518593 W Based on WO 9966100; US 2002153248 A1 Cont of US 6348139; MX 2000012453 A1 Based on WO 9966100
PRAI US 1998-98760 19980617; US 2001-14310 20011211; US 2002-122042 20020412
IC ICM B21C001-00; C22C027-02; C23C014-00; C23C014-34
ICS B32B015-01; B32B015-02
ICA C22F001-00; C22F001-18
AB WO 9966100 A UPAB: 20000218

NOVELTY - A metal article, e.g. **sputtering target**, comprises at least 99.95 wt.% **tantalum** and a uniform (100) cubic texture.
USE - The metal article is used as a **sputtering target** for electronics and semiconductor industries.
ADVANTAGE - **Sputtering target** has very fine and uniform structure and uniform strong texture.
Dwg.0/6
FS CPI EPI GMPI
FA AB
MC CPI: L04-D02; M13-G02
EPI: X25-A04

L92 ANSWER 12 OF 13 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1991-263731 [36] WPIX
DNN N1991-201216 DNC C1991-114387
TI **Target** mfr. for **sputtering** - involves melting material, producing powder using plasma rotating electrode and compression moulding.
DC L02 M13 M22 P53
PA (OSAN) OSAKA TITANIUM SEIZO KK
CYC 1
PI JP 03173704 A 19910729 (199136)*
ADT JP 03173704 A JP 1989-313989 19891201
PRAI JP 1989-313989 19891201
IC B22F003-14; B22F009-10; C23C014-34
AB JP 03173704 A UPAB: 19930928
Process comprises: (a) melting the hardly machinable materials at a predetermined compositional ratio; (b) producing a powder composed of spherical **grains**, by applying a plasma rotating electrode process (PREP); (c) charging the resulting powder in a degassed and air-tight sealed capsule; and (d) compression moulding the prod. by hot isostatic pressing.
The hardly machinable material is pref. Ti-Al, Ti silicide, W silicide, Mo silicide, Nb silicide, or **Ta** silicide.
USE/ADVANTAGE - Provides a **sputtering target** of hardly machinable materials of high **purity** and high uniformity.
@(4pp Dwg.No.0/3)@
FS CPI GMPI
FA AB
MC CPI: L02-A04; L02-H02B3; M22-H03C; M22-H03F

L92 ANSWER 13 OF 13 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1988-074500 [11] WPIX
DNC C1988-033516
TI Mfg. **sputtering target** having floor sheet part - comprising high purity and high m.pt. metals at the bottom.
DC M13
PA (TOKE) TOSHIBA KK
CYC 1
PI JP 63028860 A 19880206 (198811)* 4p
ADT JP 63028860 A JP 1986-170824 19860722
PRAI JP 1986-170824 19860722
IC C23C014-34
AB JP 63028860 A UPAB: 19930923
The target has cap shape one of whose outer periphery is **extruded**, and is silicide of high purity and high m. pt. metals such as W, Mo, **Ta** or Ti.
The **sputtering target** is made by alloying high purity and high m. pt. metals with Si by melting them on the floor sheet

part comprising high purity and high m. pt. metals located as the base of a mould.
ADVANTAGE - With the method, **sputtering target** which does not produce defects such as cracks during cooling or working of the component, is obtd.
0/1
FS CPI
FA AB
MC CPI: M13-G02

=> d L93 1-3 ti

L93 ANSWER 1 OF 4 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
TI Formation of metallic article used in forming physical vapor deposition target, involves subjecting metallic ingot to hot forging to reduce its thickness, and quenching the hot-forged product.

L93 ANSWER 2 OF 4 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
TI Formation of aluminum-comprising physical vapor deposition target, involves deforming aluminum-comprising mass by equal channel angular **extrusion**, and shaping the mass into portions of physical vapor deposition target.

L93 ANSWER 3 OF 4 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
TI High **purity** niobium metal for e.g. capacitor and resistive film layer.

=> d L93 1-3 all

L93 ANSWER 1 OF 4 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2003-201652 [19] WPIX
DNN N2003-160596 DNC C2003-051444
TI Formation of metallic article used in forming physical vapor deposition target, involves subjecting metallic ingot to hot forging to reduce its thickness, and quenching the hot-forged product.
DC M13 M29 X25
IN HIDDEN, F B; WU, C T; YI, W
PA (HONE) HONEYWELL INT INC
CYC 97
PI WO 2003008656 A2 20030130 (200319)* EN 34p C22F001-00
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
ADT WO 2003008656 A2 WO 2001-US45650 20011009
PRAI US 2001-306836P 20010719
IC ICM C22F001-00
AB WO2003008656 A UPAB: 20030320
NOVELTY - A metallic article is formed by subjecting a metallic ingot having an initial **grain** size of greater than 250 mu m to hot forging at 700-1100 deg. F to reduce a thickness of the ingot to 10-60% of the initial thickness, and quenching the hot-forged product to fix an average **grain** size of less 250 mu m within the metallic material.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(a) A method of forming a cast ingot comprising partially filling (50-90 or 5-50 vol.%) an interior cavity with a first charge of molten metallic material; cooling the first charge; partially filling the remaining unfilled portion of the cavity with a second charge of metallic material, while the first charge is only partially solidified; and cooling the first and second charges;

(b) A physical vapor deposition target (300) comprising a shape including at least one cup having a hollow, and **sputtering** surface defined along the interior surface of the cup;and

(c) A magnetron plasma **sputter** reactor comprising a plasma chamber, a target within the chamber, and a configuration of magnetic materials proximate the target.

The shape includes an exterior surface comprising a region which wraps around at least a portion a second end of the cup with a rounded corner (304).

USE - For forming a metallic article used in forming a three-dimensional physical vapor deposition target (claimed).

ADVANTAGE - The invention allows formation of three-dimensional high **purity** copper targets having an average **grain** size of at most 250 mu m.

DESCRIPTION OF DRAWING(S) - The figure shows a diagrammatic, cross-sectional view of a **sputtering target** geometry.

Target 300
Corner 304
Dwg.16/24

FS CPI EPI
FA AB; GI
MC CPI: M13-G02A; M29-A
EPI: X25-A04

L93 ANSWER 2 OF 4 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2003-148161 [14] WPIX
CR 2001-639243 [73]
DNN N2003-117086 DNC C2003-038173
TI Formation of aluminum-comprising physical vapor deposition target, involves deforming aluminum-comprising mass by equal channel angular **extrusion**, and shaping the mass into portions of physical vapor deposition target.
DC L03 T04 U11
IN ALFORD, F; FERRASSE, S; LI, J; SEGAL, V M
PA (ALFO-I) ALFORD F; (FERR-I) FERRASSE S; (LIJJ-I) LI J; (SEGA-I) SEGAL V M
CYC 1
PI US 2002174916 A1 20021128 (200314)* 19p C22C021-00
ADT US 2002174916 A1 Provisional US 2000-193345P 20000330, Div ex US 2001-783377 20010213, US 2002-194022 20020711
PRAI US 2000-193345P 20000330; US 2001-783377 20010213; US 2002-194022 20020711
IC ICM C22C021-00
AB US2002174916 A UPAB: 20030227

NOVELTY - An aluminum-comprising physical vapor deposition target is formed by deforming an aluminum-comprising mass by equal channel angular **extrusion**, and shaping the mass into at least a portion of a physical vapor deposition target having an average **grain** size of at most 45 mu m.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for a film **sputtered** from the **target**.

USE - For forming aluminum-comprising physical vapor deposition targets (claimed) for use in the manufacture of flat panel displays, e.g. liquid crystal displays.

ADVANTAGE - The method provides strictly uniform and homogeneous

straining, high deformation per passes, different deformation routes (i.e., changing of **billet** orientation at each pass of multiple passes can enable creation of textures and microstructures), and low load and pressure. It enables a decrease in the **grain** size of high **purity** aluminum and its alloys used for the manufacture of liquid crystal display by at least a factor of three compared to conventional practices. The casting defects can be removed and the desired small **grain** size and stable microstructures can be achieved.

DESCRIPTION OF DRAWING(S) - The figure shows a flow chart diagram of a method encompassed by the invention.

Dwg.8/17

FS CPI EPI
FA AB; GI
MC CPI: L03-G05A; L04-D01
EPI: T04-H; U11-C09A

L93 ANSWER 3 OF 4 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2002-090213 [12] WPIX
DNC C2002-027938
TI High **purity** niobium metal for e.g. capacitor and resistive film layer.
DC L03 M26
IN HUBER, L E; MICHALUK, C A
PA (CABO) CABOT CORP; (HUBE-I) HUBER L E; (MICH-I) MICHALUK C A
CYC 96
PI WO 2001096620 A2 20011220 (200212)* EN 23p C22B000-00
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
AU 2001096213 A 20011224 (200227) C22B000-00
US 2002072475 A1 20020613 (200243) H01B001-00
EP 1287172 A2 20030305 (200319) EN C22B001-00
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR
KR 2003001543 A 20030106 (200333) C22B034-24
ADT WO 2001096620 A2 WO 2001-US16438 20010521; AU 2001096213 A AU 2001-96213 20010521; US 2002072475 A1 Provisional US 2000-206159P 20000522, US 2001-861879 20010521; EP 1287172 A2 EP 2001-977066 20010521, WO 2001-US16438 20010521; KR 2003001543 A KR 2002-715753 20021122
FDT AU 2001096213 A Based on WO 2001096620; EP 1287172 A2 Based on WO 2001096620
PRAI US 2000-206159P 20000522; US 2001-861879 20010521
IC ICM C22B000-00; C22B001-00; C22B034-24; H01B001-00
ICS H01F001-00
AB WO 200196620 A UPAB: 20020221

NOVELTY - The niobium metal has **purity** of 99.99% or more, preferably 99.999%, and average **grain** size of 150 microns or less.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(a) metal alloy comprising niobium metal;
(b) **sputtering target**;
(c) capacitor;
(d) capacitor can;
(e) resistive film layer;
(f) article;
(g) production of niobium metal; and

(h) production of **sputtering target**

USE - **Sputtering target**, capacitor, capacitor can, resistive film layer and article (all claimed). Also for superconductors, as antireflective coating and barrier film for copper interconnects in integrated circuits.

ADVANTAGE - The niobium metal has high **purity** and exhibits fine **grain** structure and/or uniform texture.

Dwg.0/0

FS CPI

FA AB

MC CPI: L03-A01C1; L03-B01; L03-B03; L04-C13; M26-B